

**THE ROLE OF TRANSDIAGNOSTIC COGNITIVE  
BEHAVIOURAL PROCESSES IN SUICIDAL IDEATION**

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## ABSTRACT

**Background.** Suicidality has most commonly been studied within a psychiatric framework wherein it is conceptualised as a symptom or outcome of mental disorder. However, the majority of people that meet the criteria for a psychiatric diagnosis do not experience suicidality and a significant number of people that do not meet criteria for a diagnosis struggle with thoughts of suicide. Transdiagnostic approaches offer an approach to understanding and intervening with suicidality unhindered by the poor reliability, validity, and lack of specificity associated with psychiatric diagnosis.

**Aims.** This study first sought to explore differences between people experiencing or not experiencing current suicidality, in terms of engagement in transdiagnostic cognitive and behavioural (TCB) processes. Secondly, the role of TCB processes in relation to suicidality were analysed in terms of their explanatory power when considered simultaneously with established suicide-specific psychological constructs.

**Method.** A cross-sectional design was employed and a mixed sample was recruited (N = 927) through convenience and purposive sampling via an online survey. Regression analyses were performed to explore the ability of the variables to classify participants as experiencing or not experiencing current suicidality. Structural equation models were constructed to test the indirect effects of TCB processes.

**Results.** TCB processes were significantly elevated in participants experiencing current suicidality. This elevated engagement persisted in a subsample of participants that had received a psychiatric diagnosis. TCB processes were not significant predictors of suicidality in the final stage of a regression model, but their inclusion improved goodness-of-fit. Finally, TCB processes had a minor but significant negative moderating effect upon 'desire for suicide' in relation to degree of suicidality.

**Conclusion.** Transdiagnostic psychological constructs and cognitive and behavioural processes offer greater explanatory power for suicidality than does meeting the criteria for a psychiatric diagnosis. TCB processes may act as a means of coping with suicidal desire, however, and may not be indicated as initial targets for intervention.



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## **CHAPTER ONE: INTRODUCTION**

### **1. INTRODUCTION**

#### **1.1. Chapter overview**

This chapter provides an overview of the global context of suicidality, offers a clarification of the terminology used in relation to suicidality, and outlines the uses and limitations of aspects of suicidality as targets of research. The psychiatric diagnostic approach to mental distress generally, and suicidality specifically, is considered and critiqued before outlining the advantages and utility of transdiagnostic approaches. The chapter closes with a consideration of how general transdiagnostic approaches to distress and suicide-specific transdiagnostic approaches have largely been researched in isolation from one another. It is argued that there exists a strong rationale for drawing these approaches together and the means of doing so in the present study are outlined.

#### **1.2. Terminology**

The literature relating to the study of suicide has historically been hindered by the lack of agreement upon an accepted set of terms to define and classify suicide and suicide-related behaviours (Silverman, 2006; Silverman et al., 2007). In this chapter and throughout this study, the term suicidality is employed as a collective term for suicidal ideation, planning for suicide, suicide attempts, and suicide. The term has been criticised for its lack of specificity (Meyer et al., 2010) but is used in this study to amalgamate suicide-related outcomes. Specific behaviours or outcomes are referred to wherever possible. The other suicide-related terms are defined in line with the consensus paper on suicide-related nomenclature (Silverman et al., 2007): suicide is defined as the act of ending one's life intentionally; suicidal ideation refers to thoughts of taking an action to end one's life; suicide attempt refers to engaging in an act of self-injury with some intent to die; finally, suicide plan refers to an individual's consideration of a specific method to end their life.



### **1.3. The global context of suicide**

Eight hundred thousand people die by suicide globally every year. The number of completed suicides is dwarfed by suicide attempts and is the leading cause of death among the 15-29 age group globally (WHO, 2015). Suicide was the leading cause of death among men in the UK aged between 20 and 49 in 2013 (ONS, 2015). In recent decades, suicide has accounted for more deaths worldwide than homicide and war combined (WHO, 2002). The number of people that die by suicide annually is dwarfed by the number of people that struggle with suicidal ideation (Nock et al., 2008).

### **1.4. Prevalence and relevance of aspects of suicidality**

Estimates of the prevalence of suicidal ideation vary significantly by the type of population being studied. Internationally, 9.2% of people will struggle with suicidal ideation at some point in their lives (Nock et al., 2008). Of this 9.2 %, approximately 33% will develop a plan to end their lives, and 29% will make a suicide attempt. While suicidal ideation would seem to be an important precursor to the development of a suicide plan, and ultimately the first step toward a suicide attempt, it has proven to be a limited risk indicator for suicidal behaviour at the individual level (Murray, 2016). This is partly due to the low base rate of attempted suicide. Even among populations that may be regarded as high risk for suicide, such as in a cohort of people accessing mental health services, there will be a low frequency of suicide attempts in absolute terms. This precludes the development of a model that can forecast who is likely to die by suicide with any useful positive predictive value (PPV). This has been evidenced in prospective studies using data from people accessing mental health services, wherein a PPV of 5% was achieved over a 20 year span (Brown, Beck, Steer, & Grisham, 2000); a PPV of 2.8% over a 5 year follow-up (Pokorny, 1983), and a PPV of 2-5% over a 13-year period. Murray (2016) used Pokorny's (1983) findings to derive a PPV of 0.04% in a given 30 day period; a meaningful timeframe in which risk reductive strategies might be implemented comprehensively. This predictive value means that a clinician would be wrong 9996 times out of 10000 if they predicted a person were to die by suicide in a given month, based on the best risk predictor variables available, including the severity of suicidal ideation.

While suicidal ideation can only generate a very poor PPV in any individual person in a time-limited period, it does evidence good sensitivity for suicide attempts. In a study of patients accessing a variety of health services, 75% of those that attempted suicide endorsed a measure of suicidal ideation on a screening questionnaire in the week preceding the attempt (Simon et al., 2013). While in a prospective study, 88% of participants were found to have reported suicidal ideation in the two week period before a suicide attempt (Andrews & Lewinsohn, 1992). Presumably, close to 100% of those that attempted suicide had actually been experiencing suicidal ideation but chose not to report it, perhaps due to the nature of the screening instrument, or due to a desire to self-manage their distress, or the fear of involuntary hospitalisation (Czyz et al., 2013). This high sensitivity for suicide attempts accounts for the enduring enquiry among clinical staff as to the presence of suicidal ideation.

Suicidal ideation should also be considered as a distressing phenomenon in its own right, however, not merely as a pre-cursor to suicidal behaviour. Very often the presence of suicidal ideation merely prompts a series of questions designed to establish the degree of risk of suicide and to implement prompt risk management procedures.

### **1.5. Suicidality as an aspect or outcome of ‘mental illness’**

The study of suicidality has long been dominated by the assumption that it must be underpinned by meeting criteria for a diagnosis of a mental disorder (Baumeister, 1990; Jobes, 2006). This is true of intrapsychic and often epidemiological research, wherein a diagnosis of mental disorder serves as the primary independent variables for the prediction of those likely to experience suicidality or to die by suicide. There exists an understandable rationale for such an approach; some research suggests that 85 - 90% of people that die by suicide meet criteria for the diagnosis of a mental disorder at the time of their death (Arsenault-Lapierre, Kim, & Turecki, 2004; Cavanagh, Carson, Sharpe, & Lawrie, 2003). Meta-analytic examination of research exploring the relationship between mental disorders and suicide, show that people with a diagnosis of schizophrenia are 12.9 times more likely to die by suicide than the general population, 19.7 times more likely with a diagnosis of depression, 45.1 times with a diagnosis of borderline personality disorder, and 3.3 times more likely with any anxiety disorder diagnosis (Chesney, Goodwin, & Fazel, 2014). These data

support the widespread understanding of suicidality as a symptom or outcome of a psychiatric disorder. This 'topographical' approach (Jobes, 2006; Nock & Prinstein, 2004) to understanding suicidality is problematic for a number of reasons, however.

Baumeister (1990) contends this understanding is tautological, as suicidality is often regarded as proof of a mental disorder. This is explicitly the case in Diagnostic and Statistical Manual of Mental Disorders (DSM–5). DSM-V diagnoses of major depressive disorder and borderline personality disorder, where suicidality serves as one of the diagnostic criteria (American Psychiatric Association (APA), 2013), leading to the circular premise that someone is suicidal because they have a psychiatric disorder, and have a psychiatric disorder because they are suicidal. There also exists conflicting evidence for the prevalence of co-occurrence of suicidality and psychiatric disorder. Kessler and colleagues (2005) found that of those that have experienced recent suicidal ideation, 20% do not meet the criteria for any psychiatric diagnosis. This finding seems more pronounced in non-western cultures. Zhang and colleagues (2014), found that less than 50% of those that completed suicide in rural China would have met criteria for a psychiatric diagnosis.

The assumption that meeting criteria for a mental disorder and suicidality are inherently bound together also presents a number of difficulties when considering how to provide effective intervention. A pervasive degree of diagnostic overlap occurs across mood and anxiety disorders detailed under Axis 1 of the DSM-IV (APA, 2000). Brown and colleagues (2001), found that 81% of a large clinical sample in the U.S. had at least one additional Axis 1 diagnosis beyond their primary. The authors conservatively conclude that such diagnoses rarely occur in isolation. Timimi (2014), less conservatively, asserts that the need for pervasive diagnostic 'comorbidity' to describe the difficulties of people using mental health services indicates their lack of empirical and pragmatic basis. If suicidality is to be resolved by treating its associated disorder, which should be addressed first? Is it necessary to achieve a reduction in symptoms in each disorder before a resolution of suicidality occurs? Longitudinal research has shown that the experience of suicidality can extend long beyond when a patient is deemed to no longer meet the criteria for a range of mental disorders (Mehlum, Friis, Vaglum, & Karterud, 1994), highlighting their non-synonymous relationship. There is even meta-analytic evidence to suggest

that treating the symptomology of depression can result in an *increase* in suicidality as described in of selective serotonin reuptake inhibitor trial data (Breggin, 2004; Gunnell, Saperia & Ashby, 2005). While suicidality and meeting the criteria for a diagnosis of mental disorder may have an association, they are certainly not intrinsically connected. The majority of people with mental health difficulty do not experience suicidality, and a significant number of people that do not meet criteria for a diagnosis of mental disorder, struggle with thoughts of suicide. This limited ability of psychiatric diagnosis to account for suicidality is now considered in its broader context.

### **1.6. The diagnostic approach to mental distress**

The study and treatment of mental distress in the Western world has come to be dominated by medical systems of classification such as the DSM-V (APA, 2013) and the *International Classification of Diseases* (ICD-10; WHO, 2010). This method of classification is termed the 'syndromal approach' whereby the symptoms that a person presents with, act as indicators of an assumed underlying mental disorder. The clinician can then identify the most appropriate diagnosis or diagnoses by referring to the classification manual, based on what they have seen and what the patient has told them (Harvey, Watkins, Mansell, & Shafran 2004). An accurate diagnosis should then allow a clinician to determine the most appropriate treatment. The diagnostic label also ostensibly provides a common language for efficient communication with other parts of a healthcare system and a homogenous target for avenues of research. This approach, however, has been criticised for a number of reasons, including the tendency of medical labels to obfuscate life experience and circumstances and induce stigma (Walker & Read, 2002); to exclude people from accessing particular services (Pickersgill, 2013); and most pertinently to the present research, for their unsound empirical basis. Chief among these empirical criticisms of diagnosis are: the high degree of heterogeneity within diagnostic constructs; the pervasive overlap between disorders; the poor agreement between clinicians in the application of diagnoses; and the reification of dubious disease entities that offer little in terms of treatment specificity (Bentall, 2006; Boyle & Johnstone, 2014; Insel et al., 2010; Livesley, 2012). The poor validity and reliability of diagnostic constructs are of particular interest to the present study, as the failure of psychiatric diagnosis to

discretely 'carve nature at its joints' may be inhibiting efforts to understand and intervene with mental distress and suicidality.

#### 1.6.1. Problems of validity

Validity, in scientific investigation, can be defined as the extent to which a concept holds accurate correspondence to the real world (Carmines & Zeller, 1979). The poor discriminant validity among diagnostic categories is a significant issue in psychiatric classification and pervasive overlap exists (Hyman, 2010; Van Praag, 2000). Epidemiological investigation supports high rates of 'comorbidity', with 44% of respondents that meet the criteria for one mental disorder, meeting criteria for at least one other (Kessler et al., 2005). There is also an increasing recognition that findings from behavioural science and neuroscience do not converge with the categories proposed by the DSM and ICD (Hyman, 2007; Insel et al., 2010; Sanislow et al., 2010).

Evidence further suggests that the delineation between disorder and healthy functioning is arbitrary in nature for a range of diagnostic categories (Haslam, 2003; van Os et al., 1999), and that a continuum understanding of distress rather than a categorical one should be adopted. These findings contradict the 'zones of rarity' criterion proposed for validating the existence of mental disorders, that states that they should exist as entities with natural boundaries between one another, and between 'normality' and illness (Kendell, 1982). In an extensive literature review, Anckarsäter (2010) sought to examine to what degree psychiatric diagnoses could be judged as valid disorders. By weighing the available evidence against five key criteria outlined by Robins and Guze (1970); a reliable clinical picture, physiological markers, delimitation from other disorders, homogeneity of prognosis, and a genetic factor, Anckarsäter concluded that the vast majority of psychiatric diagnoses, particularly those listed in Axes 1 and 2 could not satisfy any of these key criteria. This literature could be construed to claim that mental disorders rarely occur in isolation, or that one disorder increases the risk of developing a 'comorbidity', but a more parsimonious interpretation is that the pervasive diagnostic 'comorbidity' required to describe people's experiences indicates its lack of empirical and pragmatic basis.

### 1.6.2. Problems of reliability

Empirical reliability refers to the extent to which a type of measurement can be consistently applied (Carmines & Zeller, 1979). While criticisms of diagnostic validity have been somewhat accepted by key stakeholders in global mental health research and practice, resulting in, for example, the rejection of DSM and ICD as frameworks for research funding by the National Institute of Mental Health in the U.S. (Insel et al., 2010), the classification systems have been lauded for their utility in increasing diagnostic reliability. The degree to which the DSM has actually generated meaningful reliability is debatable, however. Inter-rater reliability is a measure of the degree to which two separate raters that are seeking to make a diagnosis are in agreement and is a key benchmark by which systems of classification are judged. The DSM-5 taskforce decided upon a kappa level of between 0.2 and 0.4 as an acceptable level of inter-rater reliability (APA, 2012), however historically, and in other domains of research, kappas for inter-rater agreement of less than 0.4 are considered to be poor or to signify minimal agreement (McHugh, 2012). In research examining the use of the DSM-IV in applied, rather than research settings, a kappa range of 0.12 – 0.27 was calculated across a range of diagnoses; a statistic that indicates close to no agreement between raters (Øiesvold et al., 2013). This makes it difficult to conclude whether our current diagnostic systems are flawed in terms of measuring that which they purport to, or whether clinicians have difficulty applying them with consistency. It does not seem unreasonable to consider that it may be a combination of the two

### 1.6.3. The argument of utility

Despite these problems, the widespread use of psychiatric diagnosis across societal systems has led to what many consider to be the reification of constructs that should be better regarded as heuristics (Hyman, 2010; Insel et al., 2010). Its persistence as a framework for understanding distress has been attributed to the clinical utility it offers (Kendell & Jablensky, 2003). The argument of utility contends that despite the unreliable application of diagnoses and their lack of correspondence to any physical correlate, the diagnostic framework offers valuable etiological and prognostic information to clients and clinicians. Kendall and Jablensky propose that "...most clinicians would be hard put to cope without [diagnosis]. Diagnostic categories

provide invaluable information about the likelihood of future recovery, relapse, deterioration, and social handicap; they guide decisions about treatment; and they provide a wealth of information about similar patients encountered in clinical populations or community surveys throughout the world—their frequency and demographic characteristics, their family backgrounds and premorbid personalities, their symptom profiles and their evolution over time...” (2003, pp. 9-10).

This delimitation of utility from validity is contested, however. It is difficult to see how the utilitarian benefits of diagnosis described by Kendall and Jablensky can be divested from the validity of diagnostic constructs. An entirely invalid diagnostic construct could not be said to have any clinical utility, even if one could confidently describe the likely demographic characteristics of people in receipt of such a diagnosis (Mullins-Sweatt, & Widiger, 2009). Any arbitrary symptom list, if stringently described and defined, could be used to generate a reliable ‘diagnosis’; to research associated demographic characteristics; and to communicate the research with others (Bentall, 2006). This would not represent any meaningful utility of the diagnosis, despite facilitating professional activity and communication. Mullins-Sweatt and Widiger (2009) highlight the dearth of research that compares diagnosis-informed to diagnosis-free systems of clinical care in terms of treatment planning, improvement in client functioning, or reduction in symptom severity. The assertion that diagnosis is invaluable to healthcare systems’ ability to provide help to those in distress is not founded in evidence. Moreover, societal institutions’ current reliance on the diagnostic framework contributes to the reification of questionable disorders that may be inhibiting research and clinical intervention strategies.

The argument of the utility of diagnosis with regard to suicidality is of particular importance to the present research. As previously discussed, a diagnosis of a psychiatric disorder increases the likelihood that a person will experience suicidality, and increases the likelihood that they may die by suicide. However, the vast majority of people with a psychiatric diagnosis will not die by suicide, and a significant proportion of people that do not meet diagnostic criteria experience suicidality. Thus, a psychiatric diagnosis offers very limited predictive power and even less utility in understanding why people experience suicidality. This is a limitation of the descriptive, topographical nature of diagnosis. A number of research avenues have

drawn on psychological science, rather than psychiatric classification, to generate greater understanding, prediction, and avenues for intervention in suicidality (O'Connor & Nock, 2014). As a result of these limitations with taxonomical approaches to mental distress, there has been a growth of research and clinical approaches that eschew psychiatric classification. A prominent alternative is termed the 'transdiagnostic' approach. Literature relating to transdiagnostic approaches to understanding and intervening with mental distress and suicidality are now reviewed.

### **1.7. Identifying relevant literature for the present research**

There is a vast and diverse literature that might usefully inform an understanding of suicidality as a transdiagnostic phenomenon, drawing upon literature specific to suicide and literature specific to transdiagnostic approaches. A synthesis of this broad body of knowledge does not seem possible by employing systematic literature search strategies. A systematic approach to retrieving the most relevant literature would involve defining a specific question and generating associated search terms for entry into electronic databases. Such an approach is likely to either generate an unmanageably large return of relevant literature, or a restrictively narrow selection of research. For example, a literature search employing the terms: 'Suic\*' AND 'Cognitive' OR 'Behavioural' AND 'Processes' returns 87,329 articles from the CINAHL Plus, PsycARTICLES, and PsycINFO databases. A restriction of search terms to; 'Suic\*' AND 'transdiagnostic' returns seven articles from the same databases, of which five were screened to be of low relevance to the present research.

These problems in adopting a systematic approach to identifying pertinent literature for the present research have been identified as a common difficulty in exploratory research with a broad scope. A narrative literature review is an alternative approach that allows for a meaningful synthesis of diverse research (Ferrari, 2015). A narrative approach to identifying pertinent literature has a number of advantages for the present research. By not adhering to a strict search protocol drawing on rigid search terms, a narrative approach can better allow for the diversity of research pertaining to transdiagnostic approaches to suicidality. This approach has an inherent disadvantage, however, of a biased representation of the literature based on the reviewer's own knowledge of identification of starting points in the literature (Jones,



2004). This is intended to be guarded against where possible, through the inclusion of systematic literature reviews of a variety of sub-topics, and through the consideration of the most important research output of a range of prominent authors in the field of suicidality. The reference lists of individual relevant papers will also be explored in an effort to provide an expansive consideration of the literature. In this way, a rounded overview of the most pertinent research is hoped to be achieved, while giving precedence to evidence that has been collated systematically.

### **1.8. The transdiagnostic approach to mental health problems**

Transdiagnostic approaches are unified by a core principle of attempting to understand and intervene with multiple categories of mental distress by drawing on common underlying mechanisms (Ehrenreich-May & Chu, 2013). A transdiagnostic process can be considered at a number of levels of analysis. Ehrenreich-May and Chu (2013) broadly define a transdiagnostic process as one that can be used “to understand a set of related, but distinguishable, phenomena” in the domain of mental health difficulty. This can include relational dyads, environmental resources, and cognitive, behavioural, emotional, and physiological processes. If a process from any of these domains has some utility in explaining and intervening with different types of mental distress, then it can be considered, to a greater or lesser extent, a transdiagnostic process. Transdiagnostic approaches to mental distress place emphasis on the processes that are common to mental health problems, rather than focus on the symptom clusters that are assumed to separate them. The transdiagnostic approach seeks to understand ways in which mental distress is caused and maintained through these underlying psychological processes, rather than ascribing undue importance to how symptoms may or may not cluster together (Mansell, Harvey, Watkins, & Shafran, 2009).

A number of long-established psychological theories disregard psychiatric diagnosis in their explanation of human distress including psychodynamic (Guntrip, 1995) and systemic (Becvar & Becvar, 2012) approaches, however, it is in cognitive and behavioural domains of research that the greatest delineation and analysis of underlying processes has been undertaken (Garland, 2014; Harvey, Watkins, Mansell, & Shafran 2004). Importantly, the findings emerging from transdiagnostic cognitive behavioural therapy (CBT) research have begun to identify a range of

cognitive and behavioural processes common across psychological disorders, which are amenable to effective intervention free from any overarching diagnostic framework (Harvey, Watkins, Mansell, & Shafran 2004, Hayes et al., 2006).

This approach is in contrast to the traditional disorder-specific application of CBT, wherein treatment protocols were derived for disorders as defined by psychiatric classification manuals. These protocols are based on intervening with the assumed dysfunctional cognitive and behavioural processes associated with disorders such as depression (Beck, 1979); post-traumatic stress disorder (Ehlers & Clark, 2004); obsessive compulsive disorder (Salkovskis, 1989); and panic disorder (Clark, 1986). Each disorder-specific protocol is thought to be unique to that disorder and that a bespoke cognitive and behavioural intervention with its distinct onset and maintenance processes is required. This approach proposes that the most effective method to understand and develop interventions for disorders is to compare how people with a disorder differ from a 'healthy' control population, and how they differ from people with other disorders (Mansell et al., 2009). However, when considered in the context of the problems of validity and reliability of psychiatric diagnosis outlined above, a number of conceptual and pragmatic advantages emerge for the adoption of a transdiagnostic approach.

A transdiagnostic approach circumvents the problematic reliability and validity of diagnostic constructs. In fact, the term 'transdiagnostic' itself could be considered to be an ill-fitting description for an approach that is divested completely from diagnostic ways of working. Were it not for the pervasive use of diagnostic systems to understand and intervene with distress, and to organise healthcare services, this approach would not be conceptualised as innovative, but rather as a bottom-up approach that does not reach far beyond the available data. 'Non-diagnostic' might be a more accurate description (Mansell et al., 2009). The transdiagnostic approach takes a parsimonious approach to studying and intervening with distress, wherein the measurable underlying processes are the important focus in and of themselves, and not regarded as mere indicators of some superordinate disorder. This approach aims to make no more assumptions than are necessary and removes the need to describe difficulties as 'comorbid' when the underlying processes are the guiding

framework for understanding and intervening with distress (Pemberton & Wainwright, 2014).

This elimination of comorbidity as a concept presents a number of advantages to researchers and clinicians. It is estimated that at least half of individuals that meet the criteria for a diagnosis, will meet the criteria for at least one other (Kessler et al., 2005) and some studies have found comorbidity to be present in 81% of patients accessing a mental health service (Brown et al., 2001). A departure from diagnostic reliance would allow for greater ease and expedience for a person wishing to access a service due to a reduction in assessment procedures attempting to find the 'correct' diagnosis and corresponding 'correct' service. A clinician could begin work from the bottom up through the identification of these processes, rather than from a starting point that assumes the individual's difficulties bear close and discrete correspondence to generic CBT protocols. Importantly, this also removes the decision as to which disorder should be treated first, where comorbidity exists. The disorder-specific treatment manuals recommended by bodies such as the National Institute for Clinical Excellence offer little guidance in how the common issue of comorbidity should be approached (Shafran et al., 2009).

From a research perspective, the transdiagnostic approach offers a means to stay as close to measurable phenomena and data as possible. This represents a parsimonious approach to researching psychological distress that makes as few assumptions as possible. This bears some resemblance to the 'single-symptom' approach in research pertaining to psychosis (Bentall, Jackson, & Pilgrim, 1988). The arbitrary, rather empirical basis, for the diagnostic criteria for schizophrenia, has resulted in a disjunctive and unreliable basis for organising research. The single-symptom approach, and the Research Domain Criteria adopted by the NIMH (Insel, 2014), advocates for the study of discrete symptoms and processes decoupled from disorder categories. The transdiagnostic approach aligns closely by eschewing these artificial groupings of heterogeneous syndromes to generate more reliable variables for study.

The principles outlined thus far are shared, to a greater or lesser degree, by a variety of approaches that fall under the 'transdiagnostic' banner. Mansell and colleagues

(2009) outline how these various conceptual accounts differ in their explanations of how cognitive and behavioural processes traverse multiple diagnostic categories.

#### 1.8.1. Limited range, multiple process

*Limited range, multiple process* accounts demonstrate that some of the cognitive and behavioural processes implicated in a specific disorder may be extended to at least one other. A prominent example is the transdiagnostic CBT approach to the treatment of eating disorders (Fairburn, Cooper, & Shafran, 2003). This approach describes the existence of common psychological processes underpinning diagnoses of anorexia nervosa, bulimia nervosa, and atypical eating disorders. Previously, CBT theory and treatment relating to these diagnoses were distinct and disorder-specific. This transdiagnostic conceptualisation details how the problematic eating behaviour across diagnoses, despite its distinct manifestations, is underpinned by the common cognitive process of restricted evaluations of self-worth and the associated treatment approach has shown good clinical effectiveness (Fairburn et al., 2009; Turner et al., 2015). In a similar vein, but in the domain of psychosis, Morrison (2001) describes how cognitive and behavioural processes such as selective attention and the implementation of safety behaviours serve to exacerbate the distress connected to hallucinations and delusions, regardless of associated diagnostic category.

#### 1.8.2. Symptom-based explanations

This transdiagnostic position advocates for organising research around single symptoms or complaints rather than by diagnostic category. This approach aligns with the Research Domain Criteria (Insel, 2014) that proposes a research framework divested from diagnosis, and based instead on instances of observable behaviour. Bentall (2006) outlines the parsimonious advantage of this approach, in its close adherence to the available data. The target of research in this framework might be a symptom such as auditory hallucinations, common to diagnoses of schizophrenia and bipolar disorder, rather than researching the broad and disjunctive diagnostic category that may or may not incorporate the symptom. The elucidation of the psychological processes associated with these individual symptoms or complaints can then inform a non-diagnostic and bespoke approach to intervention (Bentall, 2006; Persons, 1986).

### 1.8.3. Universal, single process

These transdiagnostic frameworks posit that a unitary process accounts for psychological distress across all, or at least the vast majority of diagnostic categories, despite various manifestations of types of distress. This is in contrast to the *limited range* approaches described above that traverse a more restricted and homogenous range of diagnostic categories. ‘Psychological inflexibility’ is one such universal transdiagnostic process and informs the theory and practice of Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999). Psychological inflexibility refers to “the rigid dominance of psychological reactions, over chosen values and contingencies, in guiding action” (Bond et al., 2011, p. 678). This superordinate construct is comprised of six core linked subprocesses and is theorised to account for the development and exacerbation of mental distress across a very broad range of diagnostic categories. While the form of distress and problematic behaviour may differ by diagnostic category, they are understood within the overarching psychological inflexibility framework. It has been demonstrated to be significantly elevated across depressive, anxiety, and eating disorders as compared to people not meeting criteria for a diagnosis, and has been shown to be significantly elevated among people with comorbid diagnoses relative to those with a single diagnosis (Levin et al., 2014). Other *universal, single process* accounts include the self-focussed-attention model (Ingram, 1990), the repetitive thought model (Watkins, 2008), and a critical and shame-prone self-evaluative relationship (Gilbert, 2009).

### 1.8.4. Universal, multiple process

The *universal, multiple-process* approach also contends that the onset and maintenance of what are termed psychological disorders can be accounted for by a universal process. However, this approach is distinct from the single process account, in that it identifies multiple cognitive and behavioural processes that may or may not be conceptualised within an integrative theory (Mansell et al., 2009). Harvey and colleagues (2004) systematically explored the extant literature in an effort to evaluate to what extent a range of existing cognitive and behavioural processes can be considered universally transdiagnostic. Their criteria for making this judgment were that each process identified should be present in *all* of the disorders that it has been investigated in; that it has been investigated in at least four Axis 1 disorders of

the DSM-IV; and that the supporting evidence is of good methodological rigour. Their review returned twelve processes that fully met these criteria and a further two that partially satisfied them (Table 1).

**Table 1.** Universal transdiagnostic processes identified (Harvey et al., 2004)

Attention	Memory	Reasoning	Thought	Behaviour
Selective attention (internal)	Explicit selective memory	Interpretational bias	Recurrent negative thinking	Avoidance
Selective attention (external)	Recurrent memories	Expectancy bias	Positive and negative metacognitive beliefs	Safety behaviours
Attentional avoidance	Overgeneral memory*	Emotional reasoning	Thought suppression*	

\*These processes were identified as transdiagnostic but not enough evidence to meet authors' criteria for universality

An integrative account of these twelve fully transdiagnostic processes is proposed by Mansell (2005). He draws upon Perceptual Control Theory (Powers, 1973) to describe how these diverse processes overlap in a core superordinate process termed 'arbitrary control'. This account describes how psychological distress can be understood as conflict between a person's hierarchy of goals. At the lower end of the hierarchy, a person's goals may be perceptual states, such as experiencing a pleasant emotional state, whereas the higher end of the hierarchy refers to principles a person may hold or their self-concept. The goals contained at the various levels of this hierarchy may frequently come into conflict with one another. For example, a person may have a higher-level goal of having a wide social network, but a lower-level goal to not experience anxiety. When these goals come into conflict and the need for social engagement wins out, a person may tolerate the anxiety and attend a social event. Where chronic and intractable conflict between goals occurs however, psychological distress is produced and can be manifested in any of the transdiagnostic processes outlined above.

In the same domain, Mathews and MacLeod (2005) conducted a review of the cognitive processes that can be identified as transdiagnostic across a range of anxiety and mood disorders. Their review of the evidence led them to conclude that processes of attention, memory, interpretation, intrusive ideation, emotional association, inhibitory control traverse the categories of a range of anxiety and mood diagnostic constructs. The unifying superordinate process is conceptualised by the authors as 'bias'. Their review details how, despite their differences in form, a wide range of mental health problems can be accounted for in terms of biased patterns of information processing. So, for example, biased intrusive ideation refers to the tendency to engage to a greater extent with thoughts that lend themselves to the consideration of adverse implications. This overarching 'bias' process can then be understood to manifest as rumination as a seemingly disorder-specific process in depression (Teasdale, 1988) or worry as an apparent disorder-specific process in generalised anxiety disorder (Dugas et al., 1998). By considering these two processes as being subtended by this same underlying principle, rates of comorbidity between the two diagnoses (up to 73%; Clark, 1989), can be better accounted for.

These transdiagnostic cognitive behavioural approaches (TCB) have a great deal to offer suicidality research. The *universal, multiple-process approach* outlined by Harvey *et al.* (2004) is of particular interest to the current study. Their success in delineating how psychological processes traverse diagnostic categories holds an obvious parallel to the lack of exclusivity suicidality bears to any diagnostic category. It also accounts for the dimensional nature of distress and the myriad forms it can assume while generating evidence that these processes may form part of possible single 'core process' (Patel, Mansell, & Veale, 2015). This acceptance of heterogeneity may be helpful in accounting for why a significant proportion of people that experience suicidality do not meet the criteria for any psychiatric classification. The utility of this approach will be elaborated after first considering the existing approaches to understanding suicidality that abjures a diagnostic framework.

### **1.9. Transdiagnostic approaches to suicidality**

The limitations of psychiatric nosology, outlined at the beginning of this chapter, have led to non-diagnostic approaches to the understanding and treatment of suicidality.

These generally fall under two broad avenues of research; epidemiological and psychological.

#### 1.9.1. Epidemiology of suicidality

Epidemiology is concerned with the study of disease in human populations. While suicidality should not be regarded as a disease, but rather as a group of behaviours, the principles of descriptive epidemiology have been usefully applied to analyse its relationship with a range of sociodemographic characteristics. The findings presented below draw from a number of key systematic reviews that synthesise epidemiological findings on suicidality (Diekstra, 1993; Mościcki, 2001; Nock et al., 2008). This approach is useful, not only in the identification of risk factors for suicidality but also in the analysis of the relative strength of their contribution to its risk.

##### *1.9.1.1. Sex*

The relationship of sex with suicidality is a complex one, depending on the aspect of suicidality in question. Pooled analyses of cross-national data from 17 countries ( $n = 84,850$ ) reveal that women are significantly more likely to have ever experienced suicidal ideation (O.R. = 1.4); to have ever developed a plan to end their life by suicide (O.R. = 1.4); and to have ever attempted suicide (O.R. = 1.7) (Nock, et al., 2008). This sex-difference is reversed, however, when death by suicide is considered. The male:female ratio of deaths by suicide varies considerably by country, but pooled estimates are calculated at approximately 3:1. The discrepancy between the prevalence of suicidality and death by suicide between genders has been theorised to be due to the use of more lethal means of suicide and higher intent to die among men (Nock & Kessler, 2006).

##### *1.9.1.2. Age*

Cross-national data reveals a more pronounced effect of age on lifetime suicidal ideation, suicide plans, and suicide attempts. Age was found to be strongly inversely related to risk of suicidality, with odds ratios decreasing as age increased; 50–64 years (O.R.s 2.6–3.4), 35–49 years (O.R.s 4.2–5.6), and 18–34 years (O.R.s 9.5–12.2) (Nock, et al., 2008). These ratios were calculated with the over 65 years old group acting as the referent category. This is a seemingly paradoxical finding, however, as the outcomes in question refer to lifetime suicidal behaviour. It would be



expected that these would increase as age progresses unless suggested there were dramatic birth-cohort differences, which does not seem to be the case (Ajdacic–Gross et al., 2006). Nock and colleagues (2008) suggest that younger people are more likely, rather, to have had a recent experience of suicidality, and so less likely to forget, re-interpret, or withhold reporting that experience in comparison to older cohorts.

#### *1.9.1.3. Ethnicity*

The association between ethnicity and suicidality is difficult to quantify in systematic review studies that draw upon cross-national pooled analyses, given the stark differences of ethnicity between countries. Individual within-country studies have revealed effects, however. In the U.S.A., when White American is treated as the referent category, people of Hispanic ethnicity have significantly increased risk for attempts, but reduced risk for reported suicidal ideation (O.R.s 1.2 and 0.9 respectively). The same study demonstrated a significantly reduced risk for suicidal ideation and suicide attempts among Black people (O.R.s 0.6 & 0.7; Kessler, Borges, & Walters, 1999). In the U.K., research suggests that people from African and Caribbean ethnicities die by suicide at approximately the same rate as people of White British ethnicity; people of Bangladeshi and Pakistani ethnicity die by suicide at a significantly lower rate (O.R.s 0.7 & 0.4); and people of Indian and Irish ethnicity die by suicide at a significantly higher rate (O.R.s 1.3 & 1.3; Aspinall, 2002; Kessler, Borges, & Walters, 1999;). These findings suggest that the association between minority ethnicity and suicidality is a complex one and may be specific to the interaction between the minority culture and prevailing. These findings also highlight the non-synonymous relationship between psychiatric diagnosis and suicidality, as ethnic minority status confers a much higher risk for mental health problems such as psychosis in the U.K. (Fearon et al., 2006).

#### *1.9.1.4. Additional risk factors for suicidality*

Suicidality does not emerge in a social or environmental vacuum and a preponderance of evidence points to the impact of adverse life circumstances as being significantly associated. Conflict within families, serious health problems, and being unemployed are well-established risk factors for suicide (Van Orden et al., 2010). Fluctuations in unemployment, in particular, have been demonstrated to

correspond closely with societal rates of suicide (Corcoran & Arensman, 2010; Platt & Hawton, 2000; Stuckler et al., 2009). Childhood adverse experiences such as sexual, emotional, and physical abuse have been shown to have a significant 'dose-response' relationship with lifetime suicide attempts. Individuals that have suffered seven or more adverse childhood experiences have an adjusted odds ratio of 31.1 for ever attempting suicide (Dube et al., 2001).

### **1.10. Psychology of suicidality**

While meeting the criteria for a psychiatric diagnosis and a range of sociodemographic factors bear significant associations with suicidality at the group level, they do not offer useful predictive power in any individual case (Murray, 2016). Psychological science has been drawn upon from a variety of theoretical perspectives in an effort to elucidate some of the causal mechanisms of suicidality. While there has been exploration of the possible psychological mechanisms that lead to suicidality within the bounds of specific psychiatric diagnoses (Fulginiti & Brekke, 2015; Panagioti et al, 2013), the theories that have gained the most currency in the literature have treated suicidality itself as the focal point of research. Thus, transdiagnostic or non-diagnostic approaches are the dominant paradigm in the application of psychological principles to suicidality. Importantly, the majority of the dominant theories propose hypotheses and have generated evidence to account for the processes that underpin the origin of suicidal ideation and the ways in which this progresses to suicide attempts. Psychological understanding also offers theoretical and clinical utility by attempting to synthesise the complex interplay of related factors under a unifying framework in order to identify which of the factors are modifiable treatment targets (O'Connor & Nock, 2014). As outlined earlier, non-diagnostic psychological accounts of suicide have long been made (e.g. Baumeister, 1990; Freud, 1957), however contemporary models with associated bases of evidence largely draw upon a diathesis-stress framework and have a cognitive focus. A comprehensive list of psychological theories of suicide is provided by O'Connor and Nock (2014). Three models are considered now in further detail. They are selected on the basis of the clear elaboration of their underlying mechanisms and the empirical testing of their hypotheses.

### 1.10.1. Psychological models of suicidality

#### *1.10.1.1. Cubic Model of Suicide*

The Cubic Model of Suicide as conceptualised by Schneidman (1993) is a framework for understanding a suicidal person's mind on three overlapping psychological constructs. These constructs are arranged diagrammatically in the form of a cube, with each construct occupying one-dimensional axis. The first axis is termed 'psychache' and is defined as the "hurt, anguish, soreness, aching, psychological pain in the psyche, the mind" (Schneidman, 1993, p. 145). At the upper end of the psychache axis, this psychological pain is deemed to be unbearable and is the first criterion to be satisfied for suicidal behaviour within the model (Leenars, 2010). 'Press' is the second axis of the cubic model and refers to environmental events that threaten, disturb, or stress an individual. The upper end of this axis is characterised by a feeling of unrelenting intolerable pressure. The final axis is 'perturbation'. Perturbation, within the model, refers to a feeling of constriction that requires urgent action or solution. Schneidman (1993) describes how the bottom end of this axis is characterised by open-mindedness and taking one's time to decide upon the best course of action, while the upper end is marked by tunnel vision and an impulsive need to get a resolution to a problem. The model proposes that when each axis is treated as five-point scale, there are 125 possible combinations of psychache, press, and perturbation, but it is only at the 'five-five-five' rating upon each that suicidal behaviour occurs. A rating of 'five' on both psychache and press might induce suicidal ideation, but a simultaneous rating of 'five' on perturbation would be required for a suicide attempt to occur.

The Cubic Model of Suicide is regarded as significant as it was one of the first psychological models to map out how a synergy of events, circumstances, and individual psychological thresholds account for suicidality. It attempts to provide a framework to incorporate a range of individual risk factors and constructs and account for their interaction (Jobes & Nelson, 2006). Direct empirical investigation of the Cubic Model has been limited, perhaps because of difficulties in operationalising the press and perturbation constructs, however the construct of psychache has received support as a unique predictor of suicidal ideation. It has demonstrated

prospective predictive value for suicidal ideation among high-risk students (Troister & Holden, 2012); a significant association with intensity and frequency of suicidal ideation after controlling for symptoms of depression (Ollie et al., 2010); and as the most robust predictor of suicidal ideation in a U.S. homeless population (Patterson & Holden, 2012).

#### *1.10.1.2. Cry of Pain Model*

The Cry of Pain model proposes that a sense of entrapment is key in the understanding of suicidal ideation and behaviour (Williams, 1997; Williams & Pollock, 2001). The model adopts an evolutionary view and draws upon descriptions of 'arrested flight' in animal studies in which defeat in conflict without an escape route produces unusual and problematic behaviours (MacLean, 1990, cited in Gilbert & Allan, 1998). This phenomenon is applied to suicidality in humans, to develop the theory that suicidality is a reaction to an aversive situation wherein a person perceives that (i) that they have been defeated, (ii) that there is no avenue for escape, and (iii) that there is an absence of rescue factors (Williams & Pollock, 2001). The model allows for multiple psychological constructs and mechanisms at each of these stages, for example, defeat stage may pertain to judgments of self-worth, social connectedness, or some irreversible thwarting of a significant goal (Sloman, Gilbert, & Hasey, 2003).

The model has received some support in empirical tests. Suicidal people attending a general hospital for an incident of self-harm reported significantly higher levels of defeat, entrapment, and escape potential compared to matched controls, and these Cry of Pain constructs were found to enhance statistical classification of whether participants were suicidal (O'Connor, 2003). A later study again recruited people that had been admitted to hospital following an episode of self-harm and found support for the hypothesis that participant perceptions of entrapment would moderate the relationship between perceived defeat and suicidal ideation (Rasmussen et al., 2010), but this evidence is limited by the cross-sectional design of the studies.

#### *1.10.1.3. Interpersonal Theory of Suicide*

The Interpersonal Theory of Suicide (Joiner, 2005; Van Orden et al., 2010) is a psychological framework that draws on three constructs to account for how a person

develops a desire to take their own life, and how they develop an ability to actually enact suicidal behaviour. The Interpersonal Theory of Suicide is derived from an effort to draw together many of the psychological and epidemiological predictors of suicidality behaviour into a cohesive conceptual structure. The theory states that the desire for suicide is underpinned by the simultaneous presence of two constructs: (i) thwarted belongingness and (ii) perceived burdensomeness.

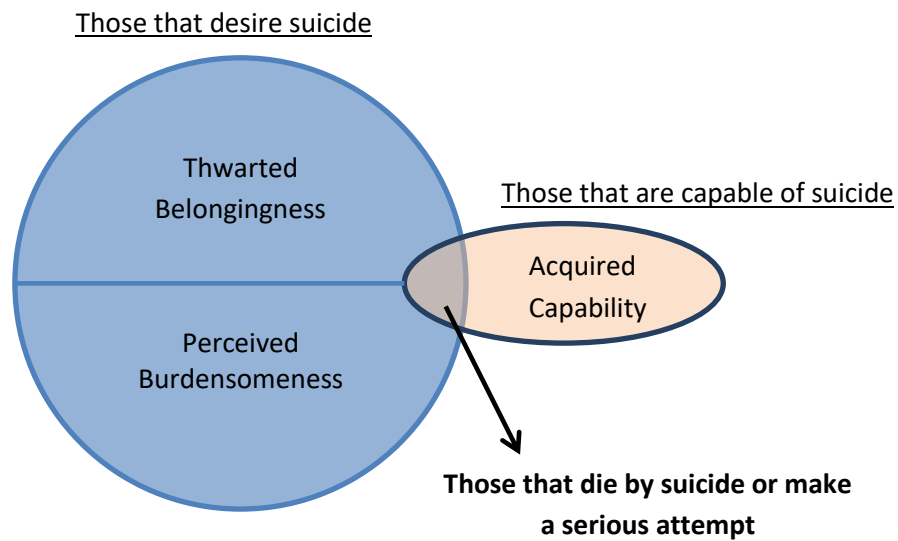
Thwarted belongingness, as conceptualised within the theory, refers to a need for social connectedness going unmet. When this occurs, it is posited not merely to result in a painful emotional state, but a thwarting of a basic and fundamental human need (Baumeister & Leary, 1995; Joiner, 2005). Its validity and relevance to suicidality is illustrated in the extensive literature that identifies social isolation as predictive of suicidality (Joiner, 2005; Nock et al., 2008). Joiner (2005) reviews how varied factors such as self-reported loneliness; the presence of marriage and family; seasonal and other temporal variation in social contact, and the absence of caring, reciprocal relationships all bear a robust association with suicidality. These predictors and variables are understood, within the theory, to give rise to this intrapsychic construct of thwarted belongingness. A person that is experiencing a high degree of thwarted belongingness will perceive a distressing dearth of meaningful social connection (Van Orden et al., 2012).

In a similar vein, the construct of perceived burdensomeness was conceived of as a means to account for the finding that family discord, being unemployed, and suffering from serious physical illness are strong predictors of suicidality. Joiner (2005) describes how these negative life events, in particular, seem to predict suicidality, as opposed to other possible distressing events. They are integrated conceptually in the proposition that they impose a sense of being a burden on others by those that have experienced them. It is this common theme of perceiving oneself as being burdensome that accounts for the relationship between these events and suicidality (Ribeiro & Joiner, 2009). A study that thematically analysed suicide notes found that notes expressing a high degree of burdensomeness were associated with more lethal suicide attempts (Joiner et al., 2002). A person that perceives themselves to be highly burdensome might consider that they make things worse for

other people, that they are useless or a drain on resources, and that their death is worth more to others than their life is (Van Orden et al., 2010).

Both these constructs are posited to wax and wane in the mind of an individual. They are each proposed to vary over time, vary according to life circumstances and relationships, and upon a continuum of intensity. The theory states that both these constructs are independently related to suicidality but also that their combined elevated presence is particularly predictive and that this interaction accounts for greater variance in the desire for suicide than their independent consideration (Van Orden et al., 2008). The interaction of these constructs is illustrated in Figure 1, as well as the final construct in the theory – the acquired capability for suicide.

The final construct of the theory is that of the acquired capability for suicide. Other psychological models of suicidality posit that those that die by suicide do so because of a person's greater risk for suicidal desire. This can be assessed by examination of the risk factors that align with that person's case; by their self-report of suicide-specific constructs such as psychache, perturbation, or entrapment; or in conversation that gives a sense of the intensity of suicidal desire. The Interpersonal Theory of Suicide, however, makes a clear distinction between the desire for suicide and the capability for suicide (Joiner, 2005). Van Orden and colleagues (2010) refer to the innate and adaptive fear that humans possess to guard against threats to survival, including injury to oneself. This construct hypothesises that a process of exposure and habituation to fear of self-injury and an acquirement of tolerance of pain leads people to develop a capacity to carry out lethal suicidal behaviours. This construct may be used to partially account for elevated rates of suicide among members of the armed forces (Gilman et al., 2014). The construct has also been supported by studies that have demonstrated higher acquired capability scores among people that have endured painful and provocative experiences such as playing contact sports, been in physical fights, or shot a gun, even after controlling for age, gender, and desire for suicide (Van Orden et al., 2008). Many people may have a desire for suicide and many people may have acquired an ability to enact suicidal behaviour, but a much smaller subset of these populations possess both states simultaneously.



**Figure 1.** Constructs of the Interpersonal Theory of Suicide

The theory has outlined a number of clear hypotheses for the interactions of these variables and how they should relate to the development of a desire for suicide and engaging in suicidal behaviour (Van Orden et al., 2008). The constructs have also been operationalised in the forms of self-report questionnaires and subjected to evaluations of validity and reliability (Van Orden et al., 2012). These considerations have generated a large evidence base supporting the main tenets of the theory through a variety of designs. Perhaps due to this comprehensive and integrative foundation of the theory and due to its precise operationalisation of constructs and hypotheses, it has generated a far larger base of supporting evidence than any of the other theories outlined in this chapter. The consensus in the available literature is that its main predictions are well supported in diverse populations (Christensen et al., 2013; Cukrowicz et al., 2011; Joiner et al. 2009; Van Orden et al., 2008; Wilson et al., 2013). These factors lead to its inclusion as the model of choice in the present study for testing suicide-specific constructs.

### 1.10.2. Other suicidality-related psychological constructs

The models of suicide outlined above have conceived of and outlined a range of constructs to elaborate their respective conceptualisations of the suicidal mind (psychache, thwarted belongingness, entrapment etc.). Other psychological constructs have also been demonstrated to bear a strong relationship with suicidality, but do so outside an integrative or comprehensive framework (O'Connor & Nock, 2014). The two that have gained the most empirical support are hopelessness and perfectionism.

The construct of hopelessness as defined by Beck and colleagues (1974) refers to a collection of negative expectations that a person holds for themselves and their future life. It has been demonstrated to hold a positive prospective relationship with suicidal ideation and eventual completed suicide (Kovacs & Garrison, 1985), and that a cut-off-point of nine on the Beck Hopelessness Scale better predicted eventual death by suicide in a large outpatient sample (O.R. 11.0) than a group defined by severe depression symptoms (O.R. 5.3) (Saltz & Marsh, 1990). However, O'Connor and Nock (2014) point that its predictive power for suicidal behaviour has reduced when constructs such as entrapment have been included in studies (O'Connor et al., 2013) but that it remains strongly associated with suicidal desire.

Perfectionism is a construct characterised by the setting of excessive or unrealistic standards for personal performance (Hewitt, et al., 1991). There has been growing interest in the relationship between perfectionism and suicidality. A prospective study demonstrated that it holds an independent positive association with subsequent suicidal ideation after controlling for depression and hopelessness (Beevers & Miller, 2004). A cross-sectional study has demonstrated that perfectionism has an ability to discriminate between people that self-harm and those that do not, beyond the effects of measures of hopelessness, symptoms of depression, and symptoms of anxiety (Hunter & O'Connor, 2003). A specific dimension of the construct, socially orientated perfectionism, is most robustly associated with suicidality (Hewitt, Flett, & Weber, 1994). This dimension is defined by the belief that others hold your behaviour to an unrealistic standard and perhaps aligns neatly with the thwarted belongingness concept from the Interpersonal Theory of Suicide.



### 1.10.3. Cognitive and behavioural processes associated with suicidality

In this section thus far, a range of suicide-related psychological constructs have been described. In this section, *processes* rather than constructs that have been studied in relation to suicidality are considered. As outlined earlier in the chapter, these processes refer to actions that are performed across the domains of memory, thinking, attention, behaviour, and reasoning. They bear similarity with the constructs outlined in that they are transdiagnostic and exist universally upon a continuum. They differ in that processes are procedures that people *engage in*, whereas constructs are more akin to states of mind.

There has been increased interest in the role of cognitive processes that are particularly associated with suicidality in recent years, as opposed to those associated with mental distress more generally (e.g. those outlined in Table 1). As outlined earlier in this chapter, identifying the full range of processes that has been studied is difficult to do with a systematic literature search strategy, but rather requires an expert knowledge of the scientific landscape. Reviews conducted by O'Connor and Nock (2014) and Ellis and Rutherford (2008) are drawn upon to consider prominent processes that have been identified.

#### *1.10.3.1. Rumination*

Rumination refers to a cognitive process wherein an individual brings a repetitive focus to their own symptoms and experiences of distress. It has proved a useful process to understand in the study of low mood as baseline measures of tendency to ruminate can be used to prospectively predict those that are more likely to meet the criteria for depression for longer (Alloy et al., 2006; Papageorgiou & Wells, 2003). Effective treatment strategies have also been developed to target the ruminative process (Papageorgiou & Wells, 2004). Its relationship to suicidality specifically has also been evaluated. In a review of 11 studies examining this association, all but one study found a significant association between rumination and suicidal ideation (Morrison & O'Connor, 2008). In longitudinal studies, baseline measures of ruminative response styles were found to be predictive of suicidal ideation at subsequent time points after controlling for variables such as sex, ethnicity, age, and initial distress (Miranda & Nolen-Hoeksema, 2007; O'Connor et al., 2007). More

recent evidence has also suggested that sex differences exist in this association; suicidal ideation among women is better accounted for by tendency to ruminate, whereas it is better explained by symptoms of depression in men (Polanco-Roman, Gomez, Miranda & Jeglic, 2016).

#### *1.10.3.2. Thought suppression*

Thought suppression is the act of intentionally attempting to stop unwanted thoughts from occurring. It appears that it is a common form of attempted mental control among people that experience distressing thoughts, but a large body of research has demonstrated that it paradoxically increases the frequency and intensity of unwanted thoughts (Wegner, Schneider, Cater, & White, 1987; Wegner & Zanakos, 1994; Wegner & Erber, 1992). A tendency to suppress distressing thoughts has been shown to be associated with both suicidal ideation and suicide attempts in both cross-sectional design and longitudinally as a predictor from a baseline measurement (Najmi, Wegner, & Nock, 2007; Pettit et al., 2009).

#### *1.10.3.3. Memory bias*

The preference for the retrieval of mood-congruent memories has long been established as a cognitive process in individuals that meet the diagnostic criteria for depression (Teasdale & Fogarty, 1979; Teasdale & Taylor, 1981). However, a specific memory bias termed 'overgeneral autobiographical memory' has been applied to the study of suicidality. Overgeneral autobiographical memory refers to a bias in a person's ability to recall specific events from their life. Instead of retrieving a memory of a particular pleasant or unpleasant experience, individuals with an overgeneral bias tend to recall broad periods or patterns of events (William & Scott, 1988). A tendency to engage in this kind of memory retrieval has been demonstrated to be associated with a range of mental health difficulties (Sumner, Griffith, & Mineka, 2010). Its first application to the study of suicidality found that recent suicide attempters displayed a significant bias towards overgeneral retrieval of memories with a positive valence when compared to individuals that had not attempted suicide (Williams & Broadbent, 1986). One possible mechanism through which this memory bias may lead to suicidality is the curtailing effect it has upon drawing on specific past experiences to generate solutions to future problems and generating a sense of hopelessness in turn (Pollock & Williams, 2001).

#### *1.10.3.4. Attentional bias*

Attentional bias has been demonstrated to have a strong association with a range of mental health difficulties and refers to an increased tendency to attend to emotionally threatening information (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & Van Ijzendoorn, 2007; MacLeod, Mathews, & Tata, 1986). This preference for attending to information that concords with a person's emotional state is posited variously as causal or at least maintaining of mental health problems due to its reinforcing, confirmatory effects (Mogg, Bradley, De Bono, & Painter, 1997). Becker, Strohbach, and Rinck (1999) found that individuals that had previously attempted suicide attended specifically to suicide-related stimuli in a way that the control group did not. A suicide-specific bias was proposed as a causal mechanism whereby an individual's increasing fixation with suicide makes it more likely to be perceived as the only solution available to them (Wenzel & Beck, 2008). This suicide-specific bias was tested in a prospective study and found to predict future suicide attempts over and above meeting the criteria for a psychiatric disorder, clinician prediction, or patient prediction (Cha et al., 2010).

#### *1.10.3.5. Problem solving*

A consistent association has been demonstrated between measures of general problem-solving ability, interpersonal problem-solving ability, and suicidality (Lerner & Clum, 1990; Levenson & Neuringer, 1971; Schotte & Clum, 1987). The assumed relationship with suicidality is that a reduced ability to problem solve leads to increased stress and hopelessness in an individual that eventually leads an individual to consider suicide as a means of escape from life problems. While there is evidence for the association between problem solving and suicidality, few studies have demonstrated a causal link through, for example, a longitudinal or prospective study design which leaves the direction of the association unclear (Ellis & Rutherford, 2008; O'Connor & Nock, 2014). It seems plausible for example, that feeling suicidal would deplete a person's capacity to problem-solve, rather than a lack of problem-solving ability leading to a person feeling suicidal. There is also evidence to suggest that the strength of association reduced when memory biases

and low mood are accounted for (Speckens & Hawton, 2005; Williams, Barnhofer, Crane, & Beck, 2005).

#### *1.10.3.6. Cognitive rigidity*

Cognitive rigidity incorporates a tendency to think in a dichotomous ‘black or white’ manner and difficulty to think in a flexible manner that opens up new possibilities or solutions (Pally, 1955) and has been implicated in various types of mental health difficulty (Meiran, Diamond, Toder, & Nemets, 2011). The process has been operationalised in a number of ways including through measurement by neuropsychological tests like set-shifting tasks to demonstrate that individuals experiencing current thoughts of suicide exhibit less cognitive flexibility after controlling for measures of symptoms of depression (Marzuk, Hartwell, Leon, & Portera, 2005). There is also evidence to suggest that cognitive rigidity has a causal relationship with suicidal ideation as evidenced in a longitudinal study that controlled for hopelessness and baseline suicidal ideation (Miranda et al., 2012).

#### *1.10.3.7. Behavioural processes*

Behavioural processes associated with suicidality were notably absent from reviews of the processes thought to cause, maintain, or exacerbate suicidality. A literature search was conducted to explore whether the transdiagnostic behavioural processes identified by Harvey and colleagues (2004) had been applied to suicidality research. The search terms “Suic\*” AND “Behavioural process\*” OR “Avoidance” OR “Safety Behaviour\*” NOT “Self harm” OR “Self injury” were entered in the Psychinfo, Psycharticles, and CINAHL Plus databases via EBSCO and returned 275 articles. Examination of the search results revealed that “Behavioural process\*” and “Safety behaviour\*” contributed zero articles, and that all articles identified were related to “Avoidance”. The titles and abstracts were examined for relevance and explicit reference to some form of behavioural process. Five articles were deemed to be relevant and can be divided into two categories: experiential avoidance and pain avoidance.

Experiential avoidance is a construct defined within acceptance and commitment therapy as a “phenomenon that occurs when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions,

thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them" (Hayes et al., 1996, p.1155). It does not exclusively refer to behavioural avoidance, but certainly, incorporates it. It has been demonstrated to moderate the relationship between acculturative stress and suicidal ideation (Zvolensky, et al., 2016); that changes in experiential avoidance correspond to changes in frequency of suicidal ideation independently of hopelessness or measures of depression (Ellis, & Rufino, 2016), and moderates the relationship between anxiety sensitivity and suicidal ideation (Zvolensky, et al., 2015).

The propensity towards the avoidance of pain was found to be related to suicidality in two studies. Engström and colleagues (2004), in a study that recruited participants with a Bipolar disorder diagnosis, found that participants that scored highly on a measure of pain avoidance had significantly more lifetime suicide attempts. Xie and colleagues (2014), in an experimental design, found that the avoidance of pain was significantly positively correlated with suicidal ideation.

### **1.11. Summary and rationale for the present study**

The psychiatric classification of mental distress has resulted in a range of categories of 'psychopathology' beset by problems of poor reliability, validity, and utility. The topographical approach of clustering signs and symptoms with the goal of identifying an underlying disease process, as has worked well in other areas of medicine, has not produced medical markers with any useful sensitivity or specificity. This topographical approach has also impeded our understanding of suicidality, as suicidal ideation and suicidal behaviour are reduced to symptoms or outcomes of psychiatric disorder. This results in an approach whereby the treatment of a disorder is assumed to produce a resolution of suicidality. The literature presented in this chapter has illustrated how suicidality and psychiatric disorder are associated but clearly not synonymous (Breggin, 2004; Gunnell, Saperia & Ashby, 2005; Jobes, 2006; Mehlum, Friis, Vaglum, & Karterud, 1994; Zhang, Xiao, & Zhou, 2014). There exists a strong rationale for studying the underlying functional processes that are shared and distinct in mental distress and suicidality.

Transdiagnostic approaches to mental distress are identified as a promising avenue for such investigation. Disregarding diagnostic entities allows for a pursuit of parsimonious ways of understanding and intervening with distress. The transdiagnostic application of CBT, in particular, has defined and demonstrated a range of cognitive and behavioural mechanisms that explain the persistence of psychological distress. The *universal, multiple process* approach as described by Harvey and colleagues (2004) represents an attractive approach to draw upon for the present study as it combines a range of well-evidenced processes in an integrative framework (Patel, Mansell, & Veale, 2015).

In parallel to transdiagnostic approaches to broader mental distress, a number of psychological theories of suicidality have also been described. These theories do not seek to provide a global account of distress, but rather to test specific mechanisms of how suicidal ideation and subsequent suicidal behaviour emerge. Given the rarity of actual suicide attempts, these theories of suicide have required the development of narrower, suicide-specific constructs in order to generate greater specificity and predictive utility. Of the psychological theories of suicide outlined in this chapter, the constructs of the Interpersonal Theory of Suicide (Joiner, 2005) are thought to be the most useful given their clear operationalisation and associated evidence. The construct of hopelessness is also drawn upon in this study given the strength of association it bears with suicidality. The clinical utility of theories such as the Interpersonal Theory of Suicide may be curtailed, however, by not incorporating the established transdiagnostic processes that are known to maintain psychological distress. The clinical application of our understanding of suicidality is dependent on identifying those mechanisms that are amenable to intervention (Luoma, 2012). With the possible exception of hopelessness (Brown et al., 2005) there is a lack of evidence for interventions targeting these suicide-specific constructs (Hill & Pettit, 2014).

The present study, therefore, represents an effort to draw together suicide-specific constructs and TCB processes to explore their interactive effect. The rationale for this approach is as follows:

- A large proportion of the variance in suicidality remains unaccounted for within psychological models of suicide. Incorporating the measurement of TCB processes may explain some of this missing variance.
- Existing studies of the relationship between cognitive and behavioural processes and suicidality have largely studied these processes in isolation, despite their close association. This study seeks to examine their integrated and simultaneous effects.
- These processes have extensive evidence of amenability to treatment. Should they be demonstrated to hold an important association with suicide-specific constructs and suicidal ideation, they represent a target for psychological intervention for suicidality.

#### 1.11.1. Research questions

The rationale and aims of this study inform the following research questions:

##### **Research question 1:**

- i. Will engagement in TCB processes distinguish people that are currently experiencing suicidality from people that are not?
- ii. Will engagement in TCB processes continue to distinguish suicidality in a subsample of people that have received psychiatric diagnoses?

##### **Research question 2:**

- i. Are the predictions of the Interpersonal theory of suicide supported in the current sample?
- ii. Do TCB processes make a significant contribution to a model that incorporates the interpersonal theory of suicide constructs and other suicide-specific constructs to account for the presence or non-presence of current suicidality?

##### **Research question 3:**

- i. Do TCB processes moderate the relationship between suicide-specific constructs and suicidality

## **CHAPTER TWO: METHODOLOGY**

### **2.1. Overview**

This chapter first outlines the epistemological framework employed in the study, before providing detail of the ethical considerations that were made in its design and implementation. The design of the study is then described, as are the materials that were used, before finally considering the analytic strategy that was applied to the data.

### **2.2. Epistemological position**

The present research is underpinned by a pragmatic epistemological position. The ‘pragmatic maxim’, as formulated by Peirce (1905), is a philosophical attitude that places a primacy of importance on the practical consequences of concepts, theories, and knowledge.

There is no single pragmatic philosophical position on ‘truth’ or what exists ontologically. The stance adopted for the present research aligns that of Rorty in relation to ‘truth’; that no description or interpretation of the world is closer to reality than any other, but that some are more useful in particular contexts and for particular purposes (Rorty, 1982). The goal of enquiry is not to substitute persisting ‘facts’ for interpretations, but rather to generate expedient ‘tools’ to take us towards a goal. This position does not require a denial that a reality that exists independently of human thought, but rather that we as investigators, cannot gain knowledge of that reality beyond our ability to perceive and reason (Pharries, 1985). As a consequence of this, the pragmatic approach is less concerned with what is ‘true’ but more interested in the instrumental value of a piece of knowledge.

This differs from the correspondence theory of truth, which asserts that a belief should be judged more or less true with respect to how closely it corresponds to reality. There are a number of problems with this definition of truth, however. It assumes that we have access to an ‘unconceptualised’ reality (McDermid, 2006).



This refers to an unproblematic imprinting of an external reality upon our minds as characterised by the Cartesian understanding of the mind as Nature's mirror (Rorty, 1979); wherein our mind passively forms an accurate representation of reality simply by experiencing it. How are we to judge or evaluate the process of "correspondence"? A mental representation cannot be independently interrogated.

A social constructionist epistemological stance would agree that our knowledge of the world cannot be said to be derived from our observations of its 'real' nature, but rather from the way that people construct it between them through social processes (Burr, 2003). A pragmatic approach differs, however, in its assertion that we are 'not free to believe anything we want about the world if we care about the consequences of acting on those beliefs' (Morgan, 2014, p. 1048). Pragmatism is generally opposed to epistemological sub-divisions such as realism or social constructionism that make claims as to where "truth" lies and asserts that our focus should be upon the practical consequences of beliefs that we hold (Dewey, 2007).

The 'goal' of the present research is to generate a greater ability to predict those at risk of experiencing suicidality and to establish whether certain patterns of thinking and behaving are important to this process. Pragmatic utility and a focus on consequences are given priority of importance. For example, this study draws upon the psychological constructs of perceived burdensomeness and thwarted belongingness. It is not of primary concern whether these constructs can be said to exist in reality as a state of mental being. What is important is that if someone scores highly on a questionnaire measure of these constructs, can a clinician make a useful judgement about their likelihood to be experiencing thoughts of suicide? It may be that developing thoughts of suicide has an external reality beyond our interpretation of the process. It may be that feeling as though you are a burden on other people can only be said to exist in a specific historical and cultural context. These perspectives on 'truth' of these concepts are secondary to their utility and problem-solving power (Dewey, 2007). While the study considers these constructs in terms of evaluations of their validity and reliability, this is done in order to make 'warranted assertions' (Dewey, 2007), rather than to make a judgement about the correspondence of these constructs to any unperceived reality.

## **2.3. Ethical approval and considerations**

### **2.3.1. Ethical approval**

Ethical approval for the study was granted by the University of East London Ethics Committee (see Appendix 1). Participants were not recruited directly through health services; thus, no other ethical approval was required.

### **2.3.2. Informed consent and confidentiality**

Prior to completing the batch of questionnaires, all participants were presented with an information sheet that outlined the nature of the research and what they could expect during their participation, including information on their right to withdraw and how their data would be stored and used (see Appendix 2). Participants were then asked to provide their consent by endorsing a check-box marked 'I agree' in the electronic survey. Participants had the opportunity to contact the researcher with questions before providing their consent. It was not possible to proceed to the main body of the questionnaire until consent had been provided. Questionnaire data was stored in a separate electronic data file to participant contact information and it was not possible to match these data. Both files were password-protected and accessed on a password-protected computer. Only the researcher had access to these data.

### **2.3.3. Potential distress and support**

The sensitive and distressing nature of suicide was given careful ethical consideration in the design of the study. The literature was consulted on the possibility of asking about suicidality creating distress or exacerbating thoughts of suicide. A recent review found no evidence that asking a person about thoughts of suicide exacerbated them in any way. The findings suggest that asking a person about thoughts of suicide may, in fact, reduce rather than increase frequency of suicidal ideation (Dazzi, Gribble, Wessely, & Fear 2014). Nevertheless, the information sheet made explicit mention of the study's enquiry with regard to thoughts of suicide. This allowed participants to make an informed choice.

Given the anonymity of participation in the study, it was not possible to contact or offer direct support to participants that may have indicated that they were struggling with suicidality. A comprehensive debrief sheet was therefore developed that

outlined a number of steps to follow should the person be struggling with suicidal ideation or psychological distress, including the contact details of statutory and non-statutory support services (see Appendix 4). It was hoped, therefore, that upon completion of the study, participants may be more aware of where to seek help than prior to participation.

## **2.4. Design**

This study employed a quantitative, survey-based, cross-sectional design where a variety of measures were completed by participants at a single time-point and the relationships between these variables were then examined. The predictor variables of interest included demographic information, depression symptomology, perceived burdensomeness, thwarted belongingness, hopelessness, and transdiagnostic cognitive behavioural processes. The outcome variables were the presence or non-presence of suicidality and degree of current suicidality.

## **2.5. Materials**

### **2.5.1. Current suicidality**

Suicidality was measured using the Depressive Symptom Inventory Suicidality Subscale (DSI-SS; Metalsky & Joiner, 1997). The DSI-SS is a self-report measure made up of four items assessing the frequency and severity of suicidality in the last two weeks. Its four items enquire explicitly about thoughts of killing oneself, whether a suicide plan has been formulated, the intrusiveness of such thoughts, and to what extent suicidal impulses have been experienced by a respondent in the last two weeks. Responses range from zero to three with higher scores indicating greater frequency and intensity of suicidality. It has demonstrated good internal consistency ( $\alpha = .86$ ; Metalsky & Joiner, 1997,  $\alpha = 0.90$ ; von Glischinski et al., 2016) and construct validity (Joiner, Pfaff, & Acres, 2002). It has also demonstrated an ability to significantly predict past suicide attempts in a sample of older adults (Ribeiro, Braithwaite, Pfaff, & Joiner, 2012), and to distinguish between those with and without a suicidal history (von Glischinski et al., 2016). Differing views exist with regard to what DSI-SS total score should warrant further investigation pertaining to suicidality, from any score in excess of zero, to a score of two or greater depending on the population sample in question (Metalsky & Joiner, 1997; von Glischinski et al., 2016).

### 2.5.2. Depression

The Patient Health Questionnaire (PHQ-9) is a nine-item self-report measure. Each item corresponds to one of the nine DSM-IV criteria for a diagnosis of major depressive disorder (Kroenke, Spitzer, & Williams, 2001; Kroenke & Spitzer, 2002). The PHQ-9 requires respondents to report the frequency with which they have experienced the various DSM-IV criteria for major depressive disorder in the past two weeks (Kroenke et al, 2009). Response options range from zero to three and correspond to “Not at all”, “Several days”, “More than half the days”, or “Nearly every day”. In addition to its use as a screening instrument for meeting categorical criteria for a depressive disorder, it has also been validated as a dimensional measure, generating a score range of zero to 27 (Kroenke, Spitzer, & Williams, 2001) and is employed in this way to track clinical change during interventions (IAPT, 2014). It has demonstrated good internal reliability, as well as sensitivity and specificity for a DSM-IV-defined diagnosis of major depressive disorder in both clinical and general populations (Kroenke et al, 2009; Kroenke & Spitzer, 2002). In the present study, an eight-item variant (PHQ-8) is employed. It has demonstrated similar psychometric properties to the PHQ-9 but omits the item pertaining to suicidality (Kroenke et al., 2009). This is important for the present study, so as not to confound the relationship between low mood and suicidality with a recursive association.

### 2.5.3. Hopelessness

The Hopelessness Scale (HS; Beck, Weissman, Lester, & Trexler, 1974) is a self-report measure that assesses the degree of hopelessness currently experienced with item content relating to feelings about the future and loss of motivation. It is comprised of 20 items with binary ‘true’ or ‘false’ response options generating a sum score ranging from zero to 20. It has demonstrated good internal consistency among diverse population groups including university students ( $\alpha = .88$ ; Steed, 2001) and people accessing outpatient mental health services for depression ( $\alpha = .97$ ; Bouvard, et al., 1992). It has evidenced good convergent and discriminant validity in assessment of its relationship to measures of depression and anxiety (Beck, Steer, & Carbin, 1988). The HS has also been demonstrated to hold a prospective relationship with suicidal ideation and eventual completed suicide (Kovacs, & Garrison, 1985).

#### 2.5.4. Perceived burdensomeness and thwarted belongingness

These Interpersonal Theory of Suicide-related constructs were both measured by the Interpersonal Needs Questionnaire (INQ; Van Orden, Cukrowicz, Witte, & Joiner 2012). This 15-item self-report measure contains one nine-item and one six-item subscale measuring perceived burdensomeness and thwarted belongingness respectively. The measure of thwarted belongingness contains items that pertain to the degree to which participants feel their need to be socially connected is met or unmet, while perceived burdensomeness items relate to the extent to which they perceive themselves as an encumbrance upon others. These constructs are theoretically related but also distinct and this proposed relationship has been supported by investigation of their psychometric properties by factor analyses and structural equation modelling (Van Orden, Cukrowicz, Witte, & Joiner 2012). A number of versions of the INQ exist but the 15-item version employed in this study has demonstrated the highest internal consistency (Hill et al., 2015). Each subscale has demonstrated convergent validity with associated constructs such as social support, loneliness, and hopelessness (Van Orden, Cukrowicz, Witte, & Joiner 2012) and together, the constructs have evidence demonstrating their prospective association with suicidal ideation (Hagan, Ribeiro, & Joiner, 2016).

#### 2.5.5. Transdiagnostic cognitive and behavioural processes

The Cognitive Behavioural Processes Questionnaire (CBP-Q; Patel, Mansell, & Veale, 2015) was employed to measure transdiagnostic processes that are associated with maintenance of psychological distress. The 15-item, self-report scale is comprised of two parts; Part A measuring cognitive maintenance processes and Part B measuring behavioural maintenance processes. The 15 items are each scored from zero to eight and correspond to the frequency of engagement in the various processes. A total score ranging from zero to 120 can then be generated by summing Part A and Part B. It has demonstrated good internal consistency in student ( $\alpha = .90$ ) and clinical populations ( $\alpha = .92$ ). Despite the scale being divided in terms of cognitive and behavioural processes, the variance generated in the measurement of these processes was found to be best explained by a single factor. It has demonstrated good test-retest reliability and validity in its convergence with a range of process-based measures, and its association with measures of depression and anxiety. Its transdiagnostic properties were supported by the finding that it could

distinguish accurately between clinical and student populations but found no effect of diagnostic category.

#### 2.5.6. Demographic and other information

Participants completed a demographic questionnaire in which age, gender, and ethnicity were recorded.

### **2.6. Procedure**

Participants accessed the study by an electronic link posted to various online forums and on social media sites. Upon accessing the study URL, participants were presented with a study information sheet and consent form (see Appendix 3).

Participants could not progress to the main questionnaire battery until they had indicated their informed consent. The main questionnaire battery took approximately 20 minutes to complete (see Appendix 5). Participants were free to discontinue at any point during completion. Any uncompleted questionnaires had their associated partial data removed from the dataset at a later point. Upon completion of the questionnaire battery, participants were presented with a debrief sheet that provided greater detail regarding the nature of the study and suggested a number of steps to follow should they be struggling with suicidal ideation or mental distress (see Appendix 4). The debrief sheet also thanked participants for their time and provided contact details of the researcher should they wish to make any future queries regarding the study. Data entered by participants were automatically transferred to a password-protected spreadsheet on a password-protected computer accessible only to the researcher and research supervisor. Participants were given the option to enter a prize draw for one of four vouchers worth £25. Contact details provided for entry into the draw were stored separately and not possible to pair with participant data. The winners were later picked by random number generator. Finally, data were later transferred to SPSS (v. 21; IBM, 2012) for analyses.

### **2.7. Participants**

#### 2.7.1. Recruitment

The study sample was recruited by convenience and purposive sampling. Participants were recruited by general advertisement of the study online through social media such as Twitter, Facebook, mailing groups, and online forums. The

advertisement consisted of a brief overview of the study and a link to the electronic survey for participants to complete online. More purposive advertising of the study was also undertaken in an effort to recruit a higher number of people that may be experiencing current suicidality. This involved posting a description of the study and link to the study in online support groups for those experiencing suicidal ideation, and to discussion forums relating to particular mental health problems that are associated with diagnoses such as depression, anxiety, bipolar disorder, and borderline personality disorder. The specific forums are not named in this paper in order to protect confidentiality.

### 2.7.2 Inclusion criteria

Inclusion criteria were broad in keeping with the continuum view of suicidality that informs the study. Participants were required to be 18 years of age or older and be able to read and understand English.

### 2.7.3. Exclusion criteria

Participants were excluded from the study if they were not able to read and understand English. This exclusion criterion was necessary in order for informed consent to be appropriately given, and due to the majority of measures employed in this study having only been validated in the English language.

### 2.7.4 Study sample

In total, a final sample of 928 participants was recruited after screening. Their demographic and other characteristics are presented in the Results chapter, as is greater detail of the screening process.

## **2.8 Data analysis**

### 2.8.1. Approach to analysis

Analyses were conducted using SPSS (v. 21; IBM, 2012). Descriptive statistics for the full range of demographic and clinical variables were calculated. Each variable was then compared in between-groups analyses with the presence or non-presence of suicidality as the independent variable using t-test, chi-square or their non-parametric equivalents as appropriate. TCB processes were analysed between groups (current suicidality vs. no current suicidality) in the whole study sample and in

a subsample of participants that had received a psychiatric diagnosis. Current suicidality was determined as any score greater than zero on the DSI-SS. A range of correlation analyses were performed to provide an initial assessment of relationships between independent and dependent variables of interest. A multiple regression analysis was conducted to test the main proposals of the Interpersonal Theory of Suicide in the study sample. This was deemed an appropriate test as it allowed for the sequential inclusion of the variables according to their theoretical importance. A binary logistic regression was conducted in order to test whether TCB processes added significantly to the study's model's ability to predict those currently experiencing suicidality. This was chosen as it maps onto the clinical rationale outlined for this study (i.e. determining who may or may not be experiencing current suicidality) and for the test's ability to generate odds ratios for variables, allowing findings to be better placed in the context of existing literature.

Finally, structural equation models were constructed in order to examine whether the relationship between suicide-specific psychological constructs and suicidality was moderated by TCB processes. The analyses were performed using AMOS (v.23; Arbuckle, 2014). The indirect effects of the suicide-specific constructs as moderated by TCB processes were calculated via custom estimands written within AMOS. The first model examined the effects of TCB processes on individual suicide-specific constructs, while the second model explored the effects of TCB processes on the collective latent 'desire for suicide' variable.

#### 2.8.2. Power calculation

A power analysis for a binary logistic regression was conducted using G\*Power for Windows, version 3.1.9.2 (Faul, Erdfelder, Buchner, & Lang, 2009), with the presence or non-presence of suicidal ideation serving as the categorical dependent variable. A manual estimated distribution of presence of suicidal ideation in the study sample of 10:1 was entered (no presence: presence (Casey et al., 2006)). With the predictor variables outlined above, a sample of 611 participants was calculated as required in order to detect a small effect size (odds ratio = 1.3) using a one-tailed test, with a power of 0.90, and an alpha of 0.05. An estimated 61 participants in this sample will report suicidal ideation. However, a quota of a minimum of 100 people experiencing suicidality was sought to be filled. This is in order to allow for effective



multiple regression and structural equation modelling analyses. The final sample recruited exceeded these requirements and allowed for the generation of sufficient statistical power.

## **CHAPTER THREE:**

### **RESULTS**

#### **3.1. Chapter overview**

This chapter provides a description of the sample of participants that were recruited, including an analysis of their characteristics compared by those experiencing current suicidality against those not experiencing current suicidality. The details of each analysis are then reported as pertaining to each research question.

#### **3.2. Sample characteristics**

##### 3.2.1. Missing data

At the close of recruitment, the study dataset held data from 974 participants. Initial examination of their demographic characteristics revealed that 46 participants reported their age as being less than 18 years old. Their data were deleted from the dataset due to not meeting eligibility criteria for participation and a lack of ethical approval to recruit such participants. Missing data were then examined. Missing data were low overall, with a highest rate of 4.7% missing data for participant age. No more than 1.8% of data were missing for any individual item on the questionnaires employed. Overall, 0.65% of possible data were missing. The vast majority of the missing data were at the item-level rather than scale level. In other words, participants had omitted one or more items from a scale in the study without missing any scale in its entirety. With item-level missing data, deletion is generally not recommended as a means of managing the data for analysis due to the loss of an entire case for a potentially minimal amount of missing data (Davey & Savla, 2009). Mean imputation is regarded as an acceptable data management strategy when the overall level of missing data is less than 5% (Tabachnick & Fidell, 2007) and performs similarly to more sophisticated strategies such as multiple imputation (Shrive et al., 2006). Forming a scale score based on partial data is considered most reliable when the internal consistencies of scales are high and a minimum threshold of at least 70% of completed items is set for establishing a total scale score (Graham, 2009). Cronbach's alphas were calculated and each scale in the study was found to be high in internal consistency (Table 2).

**Table 2.** Internal consistency of scales

Scale	Cronbach's $\alpha$
Interpersonal Needs Questionnaire <sup>1</sup>	.943
Cognitive Behavioural Processes Questionnaire <sup>2</sup>	.860
Patient Health Questionnaire <sup>3</sup>	.903
Hopelessness Scale <sup>4</sup>	.915
Depressive Symptom Inventory Suicidality Subscale <sup>5</sup>	.913

<sup>1</sup>INQ, <sup>2</sup>CBP-Q, <sup>3</sup>PHQ-8, <sup>4</sup>HS, <sup>5</sup>DSI-SS

Mean imputation was therefore implemented with a threshold of a 75% of items completed for a prorated total score to be generated (Graham, 2009). Cases that fell short of this threshold were excluded from analyses by pairwise deletion. Similarly, variables with missing data that could not be subjected to mean imputation such as age, gender, or ethnicity were also excluded by pairwise deletion. The final overall sample of 928 participants is described in Table 4.

### 3.2.2. Data distribution

Tests that rely on significance testing to determine non-normality of distribution are generally not recommended for large sample sizes (> 200) such as in the present study, as significant results are likely to be returned even in the case of very minor deviations from normality (Field, 2009). Data were instead assessed for normality of distribution by visual inspection of Q-Q plots (see Appendix 6) and through the generation of skewness and kurtosis statistics (Ghasemi & Zahediasl, 2012). Skewness and kurtosis values are presented in Table 3.

**Table 3.** Skewness and kurtosis of continuous variables of interest

Variable	Skewness	Kurtosis
Age	1.90	4.78
Burdensomeness	.28	-1.16
Belongingness	-.47	-.68
CBP-Q	-.74	.81
PHQ-8	-.30	-1.01
DSI-SS	-.38	-1.20
DSI-SS	.28	-1.02

In large samples, such as in the present study, a  $\pm 2.58$  tolerable range for skewness and kurtosis values is recommended (Field, 2009). By this criterion, all continuous variables of interest, with the exception of age, fell within acceptable limits, and this was broadly confirmed by inspection of Q-Q plots (Appendix 6). The treatment of age required consideration. A transformation of the age data may have reduced its degree of kurtosis, however debate exists as to when data transformation is an appropriate strategy. A log transformation may reduce kurtosis of age but reduces the ability to make meaningful inferences since it will share little in common with the original data (Feng et al., 2014). Field (2013) points that as sample size increases, parametric tests become increasingly robust to violations of normality due to the central limit theorem. Given the large sample size of the current study, and the majority of variables of interest being normally distributed, no transformations of data were applied. The treatment of outliers was considered in each individual analysis, as assessment of their influence varies depending on analysis strategy. The overarching principle in this study, however, was to retain outliers where their data reflect genuine scores from the population of interest, rather than data entry errors, as recommended by Field (2009), while also describing their influence upon the analysis.

### 3.2.3. Sample compared by presence and non-presence of suicidality

The total sample is described by their demographic and other variables of interest below in Table 4. Participants experiencing current suicidality and participants not experiencing current suicidality are compared in between-groups analyses by t-test and chi-square as appropriate. Standardised effect sizes are presented given the wide variation in total scale scores (Cohen's  $d$ ). A Mann-Whitney U test was conducted in addition to the t-test for age, given its non-normal distribution ( $U=50824.5$ ,  $p < .001$ ) and aligned with the findings of the t-test. The Cohen's  $d$  is presented in Table 4 to allow for meaningful comparison between variables.

**Table 4.** Sample characteristics

Variable	Total sample‡ ( N = 928 )	Current suicidality† ( N = 648 )	No current suicidality ( N = 239 )	Cohen's <i>d</i>
Age (years) <i>M</i> ( <i>SD</i> )	25.79 (7.83)	24.75 (7.18)	28.59 (8.85)	- 0.45***
Sex <i>N</i> (%)				0.33***
Male	371 (40.0)	295 (44.7)	74 (28.1)	
Female	535 (57.7)	345 (52.3)	188 (71.5)	
Ethnicity <i>N</i> (%)				
White British/ Irish/Other	766 (78.2)	514 (79.5)	212 (88.4)	
Black Caribbean/ African/ Other	12 (1.3)	10 (1.5)	2 (0.8)	
Asian British/ Asian/ Other	45 (4.8)	38 (5.9)	7 (2.9)	
Arab	5 (0.5)	5 (0.8)	0 (0)	
Mixed Ethnicity	58 (6.3)	51 (7.9)	7 (2.9)	
Other	34 (3.7)	26 (4.0)	8 (3.3)	
PHQ-8 total score <i>M</i> ( <i>SD</i> )	12.91 (7.01)	17.59 (6.19)	6.19 (5.59)	1.77***
Hopelessness <i>M</i> ( <i>SD</i> )	11.21 (5.92)	13.60 (4.67)	5.38 (4.38)	1.84***
Perceived burdensomeness <i>M</i> ( <i>SD</i> )	19.66 (11.32)	23.97 (10.16)	8.97 (5.45)	2.36***
Thwarted belongingness <i>M</i> ( <i>SD</i> )	39.75 (14.12)	45.09 (10.56)	26.69 (13.13)	1.52***
CBP-Q A <i>M</i> ( <i>SD</i> )	41.41 (11.02)	44.33 (8.97)	34.17 (12.24)	0.92***
CBP-Q B <i>M</i> ( <i>SD</i> )	31.22 (10.49)	34.43 (8.43)	23.32 (10.84)	1.13***
Total CBP-Q <i>M</i> ( <i>SD</i> )	72.62 (19.51)	78.75 (14.99)	57.41 (21.06)	1.12***
Received a psychiatric diagnosis <i>N</i> (%)	547 (58.9)	436 (67.3)	97 (39.8)	0.56 ***

‡frequency of missing data by category after mean imputation (total sample): presence suicidality (5), sex (1), ethnicity (8), age (44), received psychiatric diagnosis (2), hopelessness (2), total CBP-Q (14).†As indicated by any score  $\geq 0$  on the HDI-SS. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\*  $p < 0.001$ .

### 3.2.4. Associations between variables

Pearson's correlation coefficients (*r*) between the study variables of interest are displayed in Table 5. The vast majority of associations between variables were statistically significant, partially due to the high statistical power generated by the sample. The degree of statistical significance, the direction of the relationship, and the effect size are more meaningful descriptors, therefore, than the presence or non-presence of statistical significance.

**Table 5.** Bivariate correlations between study variables

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age	-									
2. Sex	.13**	-								
3. Received diagnosis	.08*	.08*	-							
4. PHQ-8	-.22**	-.17**	-.03	-						
5. Hopelessness	-.18**	-.24**	-.02	.73**	-					
6. Burdensomeness	-.22**	-.18**	.01	.68**	.71**	-				
7. Thwarted Belongingness	-.18**	-.30**	.02	.68**	.74**	.66**	-			
8. Suicidality	-.19**	-.23**	.02	.65**	.68**	.68**	.59**	-		
9. CBP-Q A	-.14**	.01	-.01	.52**	.51**	.48**	.46**	.40**	-	
10. CBP-Q B	-.13**	-.03	.04	.56**	.54**	.49**	.49**	.44**	.64**	-
11. Total CBP-Q	-.15**	-.01	.01	.59**	.58**	.53**	.53**	.46**	.91**	.90**

All tests two-tailed.  $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ; Male = 0, female = 1; No Diagnosis = 0, diagnosis = 1

### 3.3. Research question 1: Suicidality and transdiagnostic cognitive behavioural processes

#### 3.3.1. Whole sample analysis

An independent samples *t*-test was performed to determine if there were differences in TCB processes, as measured by the CBP-Q, between participants that were and were not experiencing current suicidality. This analysis drew upon the entire study sample. A small number of outliers were detected in the data by visual inspection of a boxplot (10 outliers, 1% of overall sample; see Appendix 6). *T*-tests were performed with and without outliers. Their removal produced little discernible effect in the *t* statistics (14.85 vs 14.13) and did not change the level of statistical significance, so the analysis proceeded with outliers included (Osborne & Overbay, 2004). Levene's test for equality of variances was found to be violated, so statistics in which equal variances are not assumed are reported on. Such a violation is somewhat expected with larger sample sizes (Nordstokke & Zumbo, 2007).

Participants currently experiencing suicidality scored significantly higher ( $M = 78.75$ ,  $SD = 14.99$ ) than participants not experiencing suicidality ( $M = 57.41$ ,  $SD = 21.06$ ) on transdiagnostic cognitive behavioural processes ( $t(378.29) = 14.85$ ,  $p < .001$ ). A Cohen's *d* of 1.12 was derived from this *t* statistic, indicating a large effect size (Cohen, 1988).

### 3.3.2. Subsample analysis of participants with a psychiatric diagnosis

A further independent samples t-test was performed with the same independent variable (presence or non-presence of suicidality) and dependent variable (total CBP-Q score). This analysis, however, was restricted to a subsample of participants that had received a psychiatric diagnosis ( $n = 547$ ). Eight outliers were identified in this subsample by visual inspection of a boxplot, amounting to 1.48% of the subsample (see Appendix 6). Again, their inclusion or non-inclusion made little difference to the  $t$  statistic and no difference to level of statistical significance derived, so they were included in the final analysis. Levene's test for equality of variances was again found to be violated, so statistics in which equal variances are not assumed are reported on. Participants in receipt of a psychiatric diagnosis, currently experiencing suicidality, scored significantly higher ( $M = 79.78$ ,  $SD = 14.87$ ) than participants in receipt of a psychiatric diagnosis, not currently experiencing suicidality ( $M = 66.78$ ,  $SD = 17.69$ ) in total CBP-Q score ( $t(130.84) = 6.79$ ,  $p < .001$ ). A Cohen's  $d$  of .80 was derived from this  $t$  statistic, indicating a large effect size (Cohen, 1988).

## **3.4. Research question 2: Do TCB processes contribute to a model employing suicide-specific constructs to predict the presence of suicidality?**

### 3.4.1. Test of the interpersonal theory of suicide in the present sample

The main predictions of the interpersonal theory of suicide were first tested in the study data by hierarchical multiple regression. The regression was run to determine if the addition of (i) perceived burdensomeness and thwarted belongingness would significantly contribute to the explanation of degree of suicidality over age, gender, and PHQ-8 score alone and (ii) whether the interaction of perceived burdensomeness and thwarted belongingness would account for significant additional variance in the final step. Variables were entered in sequential blocks in line with the Theory's proposals. See Table 6 for full details of the regression model.

There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.998 (Field, 2009). A linear relationship between the independent variables and the dependent variable of degree of suicidality was established. Linearity was established collectively and individually through examination of partial regression plots and a scatterplot of studentised residuals. Homoscedasticity was confirmed

through visual inspection of a plot of studentised residuals against unstandardized predicted values. Outliers were determined by casewise diagnostics but none demonstrated problematic leverage values (see Appendix 6; all  $< 0.2$ ; Habshah, Norazan, & Rahmatullah, 2009) and so were retained for the analysis.

Multicollinearity was a concern for two of the independent variables; perceived burdensomeness (Tolerance = 0.055, VIF = 18.17) and the interaction of perceived burdensomeness and thwarted belongingness (Tolerance = 0.039, VIF = 25.94). The high level of multicollinearity for the interaction of perceived burdensomeness and thwarted belongingness is to be expected, given that it is a product of two existing independent variables. Brambor, Clark, and Golder (2006) argue that the problematic nature of multicollinearity with regard to interaction terms in multiple regression analyses has been overstated and that they should be retained in analyses. Perceived burdensomeness is also retained in the analysis despite its high multicollinearity score. Mason and Perreault (1991) outline a number of conditions in which the problematic effects of multicollinearity can be offset, including a large sample size; where the independent variables explain a high proportion of the dependent variable's variance; and each of the independent variables retains statistical significance. The regression analysis performed satisfied each of these criteria, with 97 participants per independent variable.



**Table 6.** Summary of hierarchical regression analysis for Interpersonal Theory of Suicide variables

Predictors entered in step	$\beta$	$t$	$R$	$R^2$	$\Delta R^2$
Step 1			.65	.42	.42***
Age	-.05	-1.89			
Gender	-.12	-4.38***			
PHQ-8	.60	22.20***			
Step 2			.73	.53	.11***
Age	-.02	-.87			
Gender	-.07	-2.73**			
PHQ-8	.26	7.35***			
Thwarted belongingness	.39	11.71***			
Perceived burdensomeness	.13	3.73***			
Step 3			.73	.53	.01*
Age	-.02	-.73			
Gender	-.07	-2.76**			
PHQ-8	.24	6.75***			
Thwarted belongingness	.21	4.03***			
Perceived burdensomeness	.59	5.93***			
Belonging X Burden	.25	2.06*			

$N = 858$ ; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

The hierarchical multiple regression revealed that in step one, age, gender, and depression symptoms as determined by PHQ-8 total score contributed significantly to the regression model and accounted for 41.6% of the variance in suicidality ( $F(3,855) = 202.62$ ,  $p < .001$ ). The addition of the constructs of perceived burdensomeness and thwarted belongingness in Step 2 accounted for an additional 11.4% of the variance and this  $R^2$  change was significant ( $F(5,853) = 192.07$ ,  $p < .001$ ). Finally, in step 3, the addition of the interaction effect of perceived burdensomeness and thwarted belongingness accounted for an additional 0.2% of variance, which was a statistically significant change in  $R^2$  ( $p = .04$ ). The inclusion of all six predictor variables in step 3 accounted for 53.2% of the variance in degree of suicidality ( $F(6,852) = 161.37$ ,  $p < 0.001$ ). After the inclusion of the interpersonal theory of suicide variables, age did not continue as a significant predictor of degree of suicidality. Each step produced a significant change in the proportion of variance in suicidality that was accounted for.

#### 3.4.2. Contribution of TCB processes to a predictive model

A binary logistic regression was constructed to explore whether TCB processes would contribute to a model designed to predict the presence or non-presence of current suicidality when all suicide-specific constructs were incorporated. The dichotomous dependent variable was the non-presence or presence of current suicidality (coded as 0 and 1 respectively). Logistic regression analyses do not require normal distribution of predictor or dependent variables, however, any continuous predictor variables must bear a linear relationship to the logit of the dependent variable. This was assessed via the Box-Tidwell procedure (1962). A statistical significance threshold where  $p < 0.0071$  was indicative of a lack of linear relationship was calculated by Bonferroni correction based on the seven terms included in the model (Bland & Altman, 1995). All continuous variables were found to bear a linear relationship to dependent variable logit. Multicollinearity was not a concern for any of the independent variables (all tolerance values  $> 0.3$ , all VIF values  $< 3.0$ ).

**Table 7.** Summary of hierarchical logistic regression analysis of TCB processes predicting presence of current suicidality

Predictors entered in step	-2LL	B	SE	Wald $\chi^2$	OR	95% OR CI	
						Lower	Upper
Block 1	856.41						
Age		-.06	0.11	33.38***	.94	.92	.96
Gender		.85	1.81	22.23***	2.35	1.65	3.35
Ethnicity				7.23			
Psychiatric diagnosis		1.29	.17	2.51***	.28	.19	.39
Block 2	494.41						
Age		-.03	.02	3.5	.97	.94	1.00
Gender		-.16	.27	.35	.85	.51	1.44
Ethnicity				3.44			
Psychiatric diagnosis		.05	.25	.05	.95	.59	1.54
Depression		.06	.03	5.70*	1.06	1.01	1.12
Thwarted belongingness		.02	.01	2.66	1.02	.99	1.05
Perceived burdensomeness		.13	.02	36.85***	1.13	1.09	1.18
Hopelessness		.12	.03	15.04***	1.13	1.06	1.20
Block 3	493.54						
Age		-.03	0.2	3.49	.97	.94	1.00
Gender		-.12	.27	.20	.89	.52	1.50
Ethnicity				3.38			
Psychiatric diagnosis		.04	.25	.03	.96	.59	1.56
Depression		.05	.03	4.36*	1.06	1.00	1.111
Thwarted belongingness		.02	.01	2.31	1.02	.99	1.05
Perceived burdensomeness		.12	.02	35.50***	1.13	1.13	1.18
Hopelessness		.12	.03	13.74***	1.12	1.06	1.20
CBP-Q		.01	.01	.86	1.01	.99	1.02

$N = 840$ ; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

In the block of variables, a model containing age, gender, ethnicity, and the presence of a psychiatric diagnosis was entered and significantly improved upon the null model in the prediction of who was experiencing suicidality and accounted for 19.6% (Nagelkerke  $R^2$ ) of the variance ( $p < .001$ ). This block classified 78.8% of cases to the correct suicidality status. The model was not deemed to be a good fit to the data in this block however as assessed by Hosmer and Lemeshow test ( $p = .006$ ). Age (OR = .94,  $p < .001$ ), gender (OR = 2.35,  $p < .001$ ), and the presence of a psychiatric diagnosis (OR = .28,  $p < .001$ ) were significant predictors of suicidality in this block.

In the second block, depression score as measured by the PHQ-8 and suicide-specific constructs of thwarted belongingness, perceived burdensomeness, and hopelessness were added. The model constructed in this block was a significant improvement on the first in terms of its predictive ability ( $\chi^2 = 362.00$ ,  $p < .001$ ). It

accounted for 63.6% (Nagelkerke  $R^2$ ) of the variance of suicidality and correctly classified 87.7% of cases to the correct suicidality status. In this block, age, gender, and the presence of a psychiatric diagnosis ceased to be significant predictors. Depression score (OR = 5.698,  $p < .05$ ), perceived burdensomeness (OR = 36.852,  $p < .001$ ), and hopelessness (OR = 15.041,  $p < .001$ ) emerged as the sole significant predictors. Despite this increase in predictive power, the model remained a poor fit for the data as assessed by Hosmer and Lemeshow test ( $p = .006$ ).

The final block included all previous variables with the addition of transdiagnostic cognitive behavioural processes as measured by the CBP-Q. This model marginally improved on the second block's predictive ability and accounted for 63.7% of the variance in suicidality (Nagelkerke  $R^2$ ) and correctly classified 88% of cases to the correct suicidality status. This improvement was not statistically significant, nor was the CBP-Q as a predictor variable. Depression score (OR = 4.362,  $p < .05$ ), perceived burdensomeness (OR = 35.499,  $p < .001$ ), and hopelessness (OR = 13.739,  $p < .001$ ) remained as significant predictors. This final model however, was assessed as being a good fit to the data by Hosmer and Lemeshow test ( $p = .310$ ), unlike block one and block two.

### **3.5. Research question 3: Do TCB processes moderate the relationship between suicide-specific constructs and suicidality?**

#### **3.5.1. Individual interactions of suicide-specific constructs and TCB processes**

Each of the suicide-specific constructs and the measure of depression were demonstrated to account for either a significant proportion of the variance in suicidality or to contribute significantly to the logistic model's ability to allocate cases accurately to suicidal or non-suicidal categories. Additionally, level of engagement in transdiagnostic cognitive behavioural processes was found to be significantly different between participants experiencing suicidality and participants not experiencing suicidality. Although this level of engagement did not emerge as a significant contributor to the binary logistic regression, it did increase its predictive power and its inclusion resulted in a satisfactory goodness-of-fit assessment for the final model.

These findings informed the construction of a recursive structural equation model. The aim was not to construct a model that provided an overall good fit for the data, but rather to simultaneously explore the direct and indirect effects of the variables of interest. Hopelessness, thwarted belongingness, perceived burdensomeness, and depression were entered as exogenous variables. Degree of suicidality served as the endogenous variable in the model. Engagement with transdiagnostic cognitive behavioural processes was also entered as an exogenous variable but positioned to test its moderating effect between suicide-specific constructs and suicidality. The path diagram is presented below in Figure 2. The double-headed arrows indicate that variables co-vary, while the single-headed arrows indicate a linear relationship. The linear pathway line between TCB processes and suicidality is represented on the diagram, however, the individual indirect effects of the constructs of interest as moderated by TCB processes are not and described below instead. These were calculated by the writing of estimands within AMOS and the implementation of a bootstrapping procedure. Bootstrapping allowed for the implementation of the estimands, the calculation of standard errors of path estimates, and the provision of 90% bias-corrected confidence intervals for all effects (Shrout & Bolger, 2002).

#### *3.5.1.1. Hopelessness*

Hopelessness was confirmed as having a significant direct effect on degree of suicidality in the model ( $\beta = .267, p < .001$ ). Hopelessness also held a significant association with transdiagnostic cognitive behavioural processes ( $\beta = .205, p < .001$ ). The indirect effect of hopelessness as moderated by TCB processes was small however ( $\beta = -.003, \text{C.I.} = -.014 - .006$ ) and not statistically significant.

#### *3.5.1.2. Perceived burdensomeness*

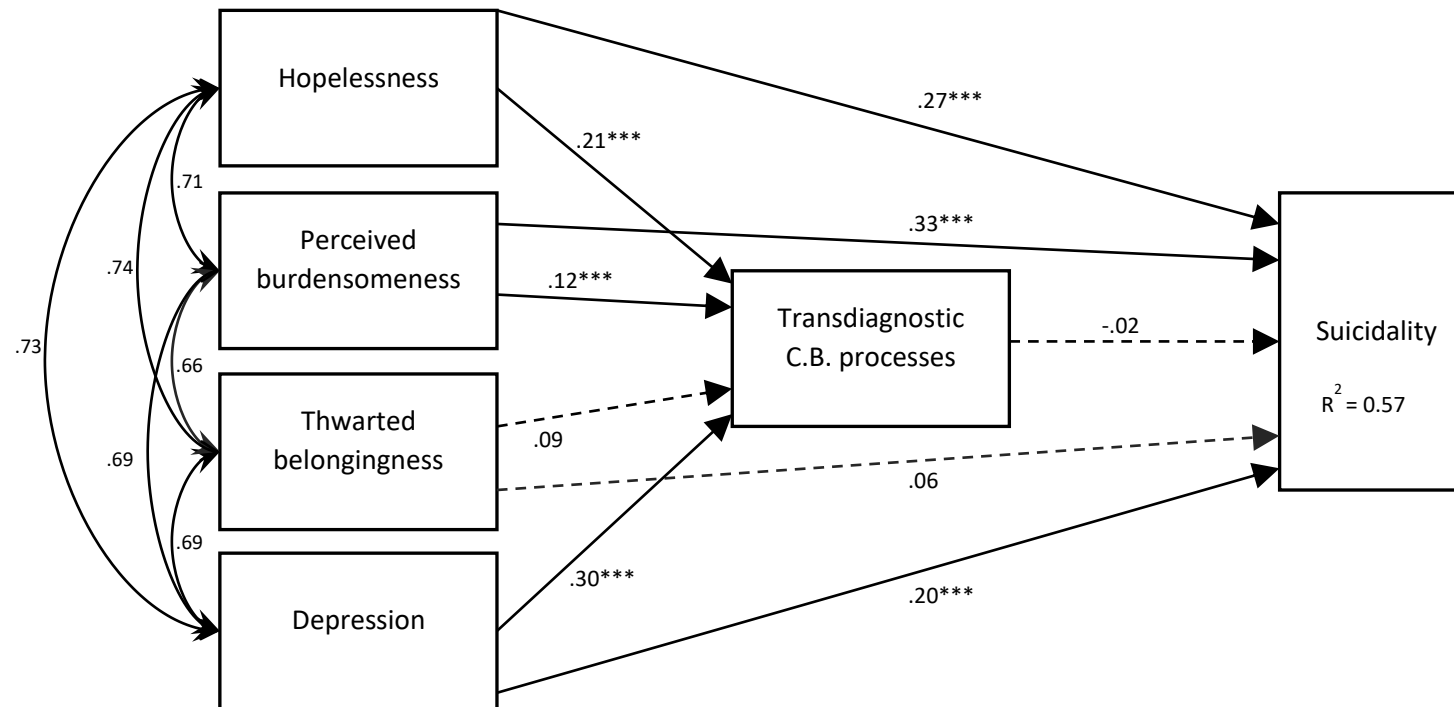
Perceived burdensomeness had the most direct effect on degree of suicidality in the structural equation model ( $\beta = .335, p < .001$ ). As with hopelessness, it also bore a significant association with TCB processes ( $\beta = .118, p < .001$ ), but the indirect effect of burdensomeness as moderated by TCB processes was small ( $\beta = -.001, \text{C.I.} = -.004 - .002$ ) and not statistically significant.

#### 3.5.1.3. *Thwarted belongingness*

The direct effect of thwarted belongingness on degree of suicidality was not statistically significant, ( $\beta = .062$ ), nor was the indirect effect of the construct as moderated by TCB processes ( $\beta < .001$ , C.I. = .000 – .002).

#### 3.5.1.4. *Depression*

Finally, depression score as measured by the PHQ-8 exerted a significant direct effect on degree of suicidality ( $\beta = .200$ ,  $p < .001$ ), but the indirect effects of the variable as moderated by TCB processes were minimal and did not reach statistical significance ( $\beta = -.002$ , C.I. = -.006 – .003).



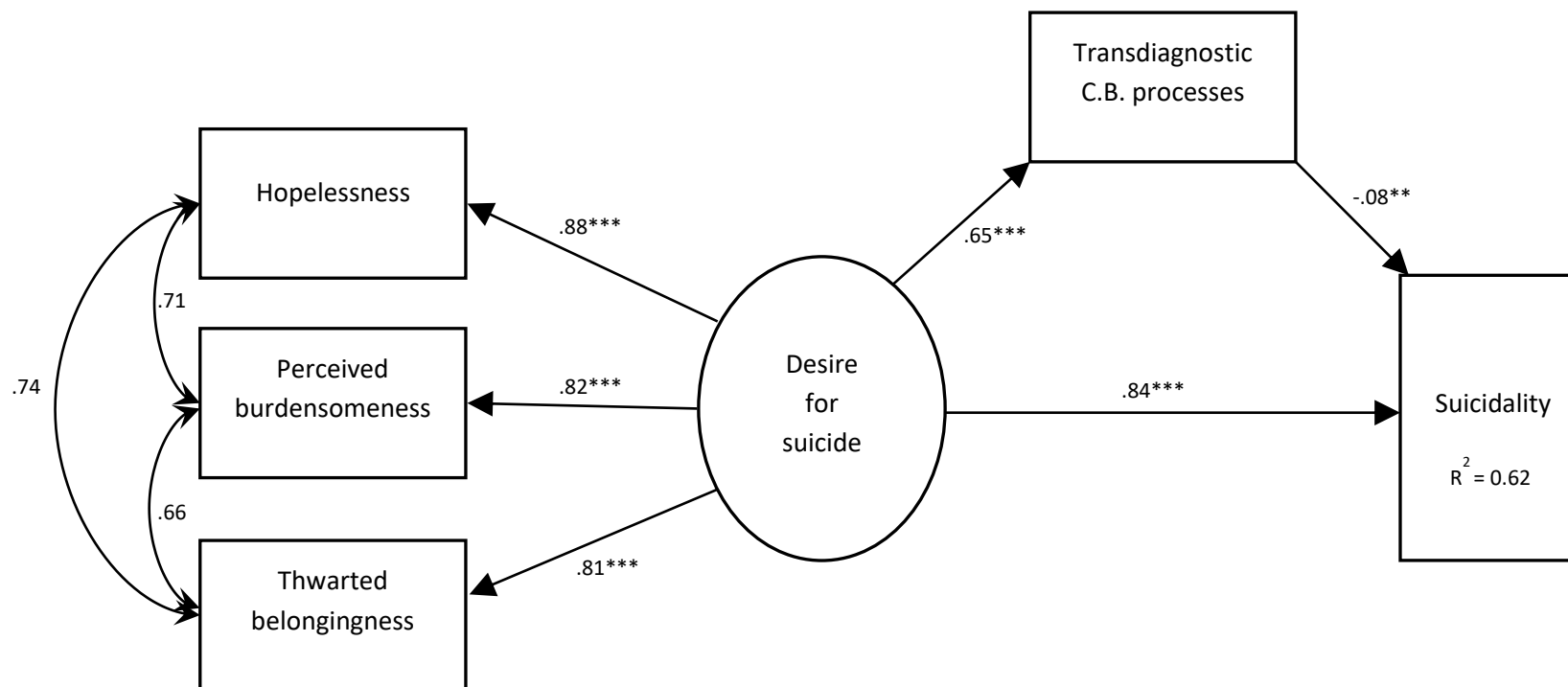
**Figure 2.** Path estimates for suicide-specific constructs and transdiagnostic cognitive behavioural processes. Standardised coefficients are shown throughout model; regression coefficients on the linear pathway lines and correlation coefficients on the co-varying pathway lines. Solid lines represent significant pathways, while dashed lines represent non-significant. All regression coefficients refer total effects; indirect and direct effects reported in-text. All correlation coefficients of predictor variables are significant at the  $p < .001$  level.  $N = 907$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### 3.5.2. Collective interaction of suicide-specific constructs and TCB processes

A final theoretically-informed structural equation model was constructed based on the Interpersonal Theory of Suicide. The theory states that the development of the desire for suicide is a complex interplay of suicide-specific constructs. To test the effect of TCB processes on this interaction of these suicide-specific constructs, a latent variable was constructed termed 'desire for suicide'. By constructing this latent variable, its direct effect on degree of suicidality could be examined, as well as its indirect effects as moderated by TCB processes. This allows for analysis of the collective interplay of suicide-specific constructs, rather than exploring their effect individually. This latent variable is represented with a circular rather than rectangular boundary (observed variables) in Figure 3. 'Desire for suicide' is comprised of the exogenous variables of perceived burdensomeness, thwarted belongingness, and hopelessness. Degree of suicidality again served as the endogenous variable of interest. TCB processes were again positioned to test their indirect effect as a moderator between 'desire for suicide' and degree of suicidality. A bootstrapping procedure was again implemented to allow for the calculation of standard error for any indirect effect observed (Shrout & Bolger, 2002).

As expected, hopelessness, thwarted belongingness, and perceived burdensomeness each demonstrated high standardised regression coefficients in relation to 'desire for suicide' and were each statistically significant at the  $p < .001$  level. 'Desire for suicide', in turn, had a large and significant direct effect on degree of suicidality ( $\beta = .84$ ,  $p = .005$ ). The results of the bootstrap analysis revealed that the indirect effect of 'desire for suicide' as moderated by TCB processes was statistically significant ( $\beta = -.055$ , C.I. =  $-.091 - -.023$   $p = .007$ ). This negative indirect regression coefficient signified that higher engagement with TCB processes reduced the relationship between 'desire for suicide' and degree of suicidality.





**Figure 3.** Path estimates for collective effects of suicide-specific constructs and transdiagnostic cognitive behavioural processes. Standardised coefficients are shown throughout model; regression coefficients on the linear pathway lines and correlation coefficients on the co-varying pathway lines. All regression coefficients refer total effects; indirect and direct effects reported in-text. Solid lines represent significant pathways, while dashed lines represent non-significant. All correlation coefficients of predictor variables are significant at the  $p < .001$  level.  $N = 907$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

## **CHAPTER FOUR: DISCUSSION**

### **4.1. Chapter overview**

This chapter initially provides a consideration of the characteristics of the sample that was recruited. The results of the main analyses are then outlined in more detail as they pertain to each individual research question and considered in the context of the relevant literature. This is followed by a consideration of the strengths, weaknesses, and implications of the study. Finally, the overall research findings are summarised and a conclusion is provided

### **4.2. Consideration of the sample recruited**

The final sample was comprised of 928 participants, and of these, 648 participants (68.9%) indicated that they were experiencing current suicidality. This is far in excess of the proportion that might be expected to be experiencing current suicidality in a representative general population sample, or a sample representative of people accessing mental health services. To place this level in context, approximately 2-3% of American university students may be experiencing current suicidality (Eisenberg, Gollust, Golberstein, & Hefner, 2007); cross-region representative surveys find approximately a national 2% prevalence rate of suicidality in the previous twelve months (Borges et al., 2010); and approximately 6% of people attending a psychiatric outpatient service in the U.S. reported experiencing current suicidality (Viguera et al., 2015). The prevalence of suicidality recruited for this study is therefore far in excess of that which would be expected in a sample drawn from a university or from a mental health service. The sample was relatively well divided in terms of sex, but overwhelmingly white in terms of ethnicity. This precluded analysis of the effects of ethnicity on suicidality, as some ethnic categories, even after their amalgamation, contained insufficient numbers for chi-square analysis. Ethnicity could therefore only be entered to analyses as a single multi-level variable.

The overall sample had a mean PHQ-8 score of 12.91. The authors of the PHQ-8 recommend a score of 10 or greater as a threshold (Kroenke, et al., 2009), indicating that a significant proportion of the present sample would likely meet the

diagnostic criteria for depression. The study sample had an overall mean score of 19.66 in perceived burdensomeness and 39.75 in thwarted belongingness as measured by the INQ. These mean scores are far in excess of those recorded in a U.S. student sample (2.06 and 10.63) and even significantly higher than those recorded in a U.S. psychiatric inpatient facility (11.73 and 24.07) (Cero et al., 2015). These comparatively high mean scores are not unexpected when the high level of suicidality in the present sample is considered. The mean score for the CBP-Q was calculated at 72.62 for the overall sample. This is significantly higher than the student and community sample mean scores recorded in the original paper (49.37 and 48.04 respectively); but somewhat comparable to the mean score of the clinical sample recruited (64.64; Patel, Mansell, & Veale, 2015). Hopelessness, as measured by the HS returned a mean score of 11.21, and was far in excess of that recorded in a large U.S. university population (3.22; Troister, D'Agata, & Holden, 2015) and higher than the mean score derived from a U.S. psychiatric inpatient sample (9.41; Andover & Gibb, 2010).

In summary, the sample recruited for the present study bore more similarity with a population recruited from acute mental health services than a community or student sample in terms of their overall clinical characteristics. The targeted recruitment through forums designed to support people struggling with suicidality seems a plausible explanation for these high scores across the constructs and processes measured. While the sampling method of present study restricts any claims of being representative of a particular group, the high number of people recruited experiencing suicidality allowed for effective multifactorial analyses. It allowed for the study to detect relatively small effect sizes as statistically significant and to generate confidence in distinguishing between 'noise' and 'signal' in the data.

#### **4.3. Research Question 1: Suicidality and transdiagnostic cognitive behavioural processes.**

The first research question of this study was to ascertain whether people experiencing suicidality reported higher engagement with TCB processes than those not experiencing suicidality. The between-groups comparison revealed that people struggling with suicidality scored significantly higher on the CBP-Q. This difference was statistically significant at the  $p < .001$  level, however, the majority of

between-group differences in this study were highly statistically significant due to the power generated by the large sample size. The more meaningful result was that the difference between the groups was equivalent to a standardised effect size of  $d = 1.12$ . This statistic is derived by dividing the difference in means between the two groups by their pooled standard deviation and indicates that the group experiencing suicidality scored in excess of one full standard deviation higher in CBP-Q score than the group that were not experiencing suicidality. Cohen (1988) offered that standardised effect sizes might be approximately regarded as small ( $d = .2$ ), medium ( $d = .5$ ), and large ( $d = .8$ ). By that metric, this is a substantial between-groups difference and indicates that 62% of the suicidality group's CBP-Q score did not overlap with the non-suicidality group. To place this difference in further context; a recent study of U.S. army veterans struggling with depression, found differences between participants with suicidal ideation and no suicidal ideation with regard to hopelessness ( $d = 1.03$ ), burdensomeness ( $d = 0.95$ ), and thwarted belongingness ( $d = .70$ ) (Pfeiffer et al., 2014). This gives some indication that TCB processes, at least in simple between-groups analysis, are comparable to established suicide-specific constructs in distinguishing between people with and without current suicidality. However, when compared to suicide-specific predictors in the present study, TCB processes did not evidence as pronounced a distinguishing ability. The difference between people with and without suicidality was more pronounced in hopelessness, perceived burdensomeness, and thwarted belongingness, although the mean difference was comparable in thwarted belongingness ( $d = 1.52$ ).

The second part of this research question sought to examine whether any differences in TCB processes between those with and without current suicidality remained true among people that had received a psychiatric diagnosis. Engagement in TCB processes has been established to be higher among people with a psychiatric diagnosis and any between-group differences elucidated might simply be reflective of higher rates of suicidality in this group. This analysis revealed that even within a subsample comprised only of people with a psychiatric diagnosis, engagement in TCB processes was still significantly higher among those experiencing current suicidality. Not only did the mean difference remain statistically significant, the standardised effect size calculated from this difference was large ( $d = .80$ ). This lends support to the potential importance of engagement

in TCB processes as a more useful predictor of suicidality than the binary and categorical meeting of psychiatric diagnostic criteria.

#### **4.4. Research Question 2: Do TCB processes contribute to a model employing suicide-specific constructs to predict the presence of suicidality?**

The second research question sought to examine to what extent TCB processes might add to our ability to predict who may be experiencing current suicidality. The interpersonal theory of suicide is one of the best evidenced and elaborated models of suicidality and it was important to first establish the degree to which its predictions were supported in the current sample. The hierarchical multiple regression found that the theory's constructs of burdensomeness and thwarted belongingness made a significant contribution to accounting for variance in suicidality beyond age, sex, and depression score. Additionally, the final step in the regression indicated that the interaction effect of burdensomeness and thwarted belongingness also contributed significantly to the model, beyond the individual effects of each of these constructs, albeit with a small effect size. These results are consistent with other tests of the interpersonal theory of suicide (Christensen, Batterham, Soubelet, & Mackinnon, 2013; Joiner et al., 2009; Van Orden, et al., 2008). By first establishing its applicability to the present sample, the potential additive effects of TCB processes were better able to be evaluated.

The hierarchical logistic regression included all predictor variables in the study sequentially. The second block of variables included all predictor variables, including demographic and suicide-specific constructs and was able to classify 87.7% of cases correctly to the binary presence or non-presence of suicidality outcome. This represents a high degree of accuracy considering the lack of any suicide-related items in the predictor variables (e.g., the self-harm/ suicidal intent item of the PHQ-9 is not included in the PHQ-8 as employed in this study). To provide some context, a study with a comparable cross-sectional design employed age; education; severity of depression; medical burden; availability of social support; degree of disability; and history of suicidality; and correctly classified 69% of cases for the presence or non-presence of suicidal ideation (Alexopoulos et al., 1999). It is interesting to note that the presence or non-presence of a psychiatric diagnosis failed to continue as a significant variable after the inclusion of suicide-specific constructs.

The final step of the model added TCB processes as a predictor variable. This resulted in an increase to 88% of cases being correctly classified. While 0.3% is a minor increase in the model's classification capability and TCB processes did not enter the model as a significant individual predictor, its inclusion was the first step of the model deemed to be a good fit to the data. This is an interesting finding to consider further. Despite the good classification ability of the model in block 2, and its high pseudo  $R^2$  (63.6%), the significant Hosmer and Lemeshow test indicated that the model may be poorly specified. This might seem contradictory; that a model can generate high predictive power but fit that data poorly, but it is not uncommon (Hosmer, Lemeshow, & Sturdivant, 2013). A goodness-of-fit statistic, such as the Hosmer and Lemeshow test, is not a measure of how well the set of predictor variables account for the dependent variable, but rather whether a model could be improved by introducing greater complexity, such as exploring for interaction effects between variables (Allison, 2014).

#### **4.5. Research Question 3: Do TCB processes moderate the relationship between suicide-specific constructs and suicidality?**

The finding that TCB processes significantly improved the goodness-of-fit of the regression model lent weight to the rationale for the third research question; do interaction effects exist between TCB processes and suicide-specific constructs? In other words, does higher engagement in TCB processes moderate the relationship between hopelessness, burdensomeness, or thwarted belongingness and suicidality? As outlined in the method chapter, structural equation modelling presents a number of advantages for this aim, including its ability to simultaneously analyse the direct and indirect effects of variables upon one another in a system of regression equations and its capability to incorporate latent variables.

The first structural equation model represented an effort to map the simultaneous direct and indirect effects of the suicide-specific constructs to degree of suicidality. Each of the constructs of hopelessness, perceived burdensomeness, thwarted belongingness, and depression were entered as purely exogenous (predictor variables) based on their theoretical relevance or statistical significance, as in the case of depression score. Their individual indirect influences upon degree of

suicidality were explored as moderated by TCB processes. As expected, and as in the preceding logistic and multiple regressions, each construct, with the exception of thwarted belongingness, bore a significant direct relationship with degree of suicidality. None of the indirect effects, as moderated by TCB processes, were statistically significant. The second structural equation model was based more explicitly in the literature surrounding the development of suicidality. The Interpersonal Theory of Suicide, as well as other theories such as the Integrated Motivational-Volitional Model of Suicidal Behaviour, have demonstrated the complexity of interaction between a range of suicide specific constructs (O'Connor, 2011; Van Orden et al., 2010, O'Connor & Nock, 2014). For this reason a latent construct, termed 'desire for suicide' was entered into the model. The construct was inferred, rather than observed, from hopelessness, perceived burdensomeness, and thwarted belongingness. This latent construct bore a far larger direct effect with degree of suicidality ( $\beta = .84$ ) than any of the constructs individually, giving some indication as to their multiplicative effect. The indirect effect of desire for suicide, as moderated by TCB processes, was statistically significant, unlike the constructs individual effects. While the effect size was relatively small ( $\beta = -.06$ ), it was significant at the level of  $p = .007$ , indicating that it is unlikely to be a sampling error or statistical anomaly.

The finding that the indirect effect of desire for suicide, as moderated by TCB processes, was a negative one was unexpected. Engagement with TCB processes appears to weaken the relationship between desire for suicide and degree of suicidality. This is in contrast to the expectations outlined for this study and, at first glance, is a seemingly paradoxical finding. Both the extant literature and the data generated in the present study indicate that suicide-specific constructs and TCB processes bear a positive association with suicidality. In other words, higher scores on any measures of these variables are associated with higher scores for suicidality. It is not implausible statistically or theoretically, however, that this interaction effect produces a negative relationship with degree of suicidality.

From a theoretical perspective, it does not seem unreasonable to posit that higher engagement with TCB processes might reduce the process through which the interplay of hopelessness, burdensomeness, and lack of belonging lead to

suicidality. The array of TCB processes captured by the CBP-Q including selective attention towards certain stimuli, attention to sources of safety, avoidance behaviour, and experiential avoidance, to greater and lesser extents, represent ways of coping with negative experiences. The complex interplay of feeling as though one is a burden upon others, feeling hopeless about one's future, and feeling as though one does not 'fit in', might be ameliorated in the short-term by actively suppressing these feelings or by subduing them with alcohol or drug use. There is a wealth of evidence demonstrating that the long-term engagement in such processes is counter-productive and likely to exacerbate the negative experiences they are employed to manage (Ehlers, Mayou, & Bryant, 1998; Ehling & Watkins, 2008; Wells & Matthews, 1996). It is also clear however, that there is considerable variability in the duration of episodes of suicidality, ranging from acute to chronic (Joiner & Rudd, 2000; Witte, Fitzpatrick, Joiner, & Schmidt, 2005). The minor ameliorative effect of TCB processes on the desire for suicide observed may represent short-term coping that could be argued to be adaptive for a given context i.e. increased experiential avoidance to overcome acute feelings associated with suicidality.

#### **4.6. Clinical implications of findings**

##### **4.6.1. Therapeutic intervention for suicidality**

Understanding the psychological processes that underpin suicidality is a complex task. Evidence is increasingly converging to suggest that the interplay of a variety of psychological states, traits, and processes interact to influence a person to think about wishing to die and taking their own life (Jobes, 2006; Joiner, 2007; O'Connor, 2011). Within this multiplicity of factors, a distinction is often drawn in the literature between modifiable, dynamic risk factors and static risk factors (Hill & Pettit, 2014). In the latter group are variables such as a person's age, their sex, adverse events or trauma that they have experienced, or whether or not they have attempted suicide in the past. The former group includes many of the variables chosen for inclusion in the present study including hopelessness, perceived burdensomeness, thwarted belongingness, and a range of transdiagnostic cognitive and behavioural processes. These variables seem especially worthy of clinically-driven research, given the evidence for their amenability to change, particularly cognitive and behavioural processes. Good evidence exists for the variability across time in engagement in processes such as avoidance, thought



suppression, and rumination (Kashdan, Barrios, Forsyth, & Steger, 2006; Nolen-Hoeksema, 2000; Wenzlaff & Wegner, 2000). In the domain of suicidality research, some evidence has been generated for the amenability of hopelessness to intervention (Brown et al., 2005), but very little for the strongly predictive constructs of perceived burdensomeness and thwarted belongingness (Hill & Pettit, 2014).

This study aimed to delineate the relative influence of TCB processes to suicidality, due to their amenability to change. In the preliminary analyses, it appeared as though TCB processes bore noteworthy relevance. Higher engagement was significantly associated with degree of suicidality and this held true in the subsample of participants with psychiatric diagnoses. This seemed important as it suggests that it may hold some of the specificity that is sorely required for targets of suicide-focussed psychological treatment. More thorough analysis revealed, however, that the interaction effect of suicide-specific constructs and TCB processes was actually reductive of degree of suicidality. This unexpected finding precludes speculation that employing psychological interventions aimed at reducing unhelpful TCB processes may reduce current suicidality. It may instead be the case that these TCB processes are a means of managing the distressing effects of the factors that lead to a desire to suicide. Although they may be counterproductive in the longer-term and detrimental to a person's general mental wellbeing, they may serve an 'analgesic' function in the short-term. Established, evidence-based psychological interventions for suicidality advocate for the early stages of therapy to be centred around understanding the person's suicidal phenomenology and instilling hope through the development of an authentic therapeutic alliance (Comtois et al, 2011; Jobes, 2006). It may be that more technical psychological interventions, such as targeting these TCB processes, should be considered after the resolution or stabilisation of suicidality.

#### 4.6.2. Identifying those at risk of suicidality

This study was also concerned with the identification of people that might be at risk for feeling suicidal. There are a great number of reasons that someone may not wish to disclose to friends, family, or mental health professionals that they are feeling suicidal. For some people, suicidality represents a powerful, private means of escaping psychic pain that they may not wish to surrender (Baumeister, 1990;

Schneidman, 1987). For others, the fear of involuntary hospitalisation or some other drastic restriction of liberty may reduce their willingness to disclose (Czyz et al., 2013), or the relationship they hold with the assessing clinician (Jobes, 2000). Even the phrasing of an item in a screening questionnaire may influence a person's disclosure of thoughts of suicide (Boudreaux & Horowitz, 2014). It is imperative therefore for clinicians to have access to other sources of information that may indicate that a person is at high risk for suicidal desire.

It is difficult to assess the contribution that TCB processes may make in this regard based on the findings from this study. Elevated engagement in TCB processes is certainly associated with suicidality and this remains true in a subsample of people that have received a psychiatric diagnosis. When TCB processes were considered with measures of hopelessness, burdensomeness, and thwarted belongingness, their contribution was less significant, but still effected a better fit for a model of prediction. The pragmatic reality of mental health care means that a wide array of measures cannot be administered at every client contact. TCB processes, as measured by the CBP-Q, may offer utility in this regard. Not only do they hold utility as markers of the progression of interventions, but very elevated engagement with the processes in the absence of any overtly disclosed suicidality may give a clinician cause to be alert for possible barriers to disclosure. This could be done as part of on-going routine care in a way that weekly completion of a battery of measures incorporating hopelessness, burdensomeness, and thwarted belongingness may not be feasible. Such an exercise would allow for discussions about what a person is coping with and how they are trying to do so, rather than relegating discussion about suicidality to a discrete assessment that is only revisited in the consideration of risk.

#### 4.6.3. Wider implications

The findings from this study offered further support for the growing body of literature that indicates that the presence of a diagnosable psychiatric disorder offers less utility than transdiagnostic or non-diagnostic phenomena. The analyses in this study revealed that receipt of a diagnostic label only offered explanatory power for suicidality when psychological constructs and processes were excluded. The degree of hopelessness a person experiences or the extent to which they perceive themselves to be a burden upon others bear a much more powerful

association with suicidality. This is an important message for healthcare professionals and our wider society to understand. The development and resolution of suicidality is not synonymous with the identification and treatment of 'psychiatric disorder'. Meeting the criteria for a psychiatric disorder may well increase the likelihood of being suicidal, but despair, alienation, and feeling like one is a burden have a more pronounced effect. An important implication is that suicide is not the preserve of medical or other healthcare professionals, but for our entire society. The solutions to the processes through which someone may become suicidal do not have to be shrouded in medical terminology or psychological science. For example, increased work capability assessment for claimants of disability benefits in the U.K. have been associated with increased rates of suicide after controlling for confounding factors (Barr et al., 2016). It seems very plausible to hypothesise that such assessments contribute very directly to a person feeling hopeless and as though they are a burden upon others – no intermediary psychiatric disorder is required to account for any increase in suicidality. What healthcare professionals eventually assess as psychological constructs or psychiatric disorders may often have social and political geneses.

## **4.7. Strengths and limitations**

### **4.7.1. Strengths of study**

Many of the studies reviewed in the conceptualisation and design of this study were limited by low sample sizes, limited statistical power, and restricted degrees of freedom. Very often, this required the use of a limited number of variables and the generation of wide confidence intervals for any effects detected. A particular strength of this study was the comprehensive array of variables employed and the recruitment of a sample that allowed the testing of a range of interactions and effects with adequate statistical power.

Numerous variables identified in the literature as being important to the understanding of suicidality were included in the study. This is important to the inferences made from the analyses. As noted, there is a large degree of overlap between constructs such as depression, hopelessness, burdensomeness, and thwarted belongingness. In a similar vein, there is a high degree of overlap shared by the TCB processes, as is demonstrated by their high loading upon a single factor (Patel, Mansell, & Veale, 2015). Similar research has examined the

interaction effect of, for example, a single construct with a single cognitive process. Such studies run the risk of being confounded by unmeasured related variables.

There were advantages to the online recruitment strategy adopted by the study. There is a tendency in behavioural and psychological research to recruit from university student populations, often without adequate justification, leading to so-called 'WEIRD' (Western, Educated, Industrialized, Rich, Democratic) study samples (Henrich, Heine, & Norenzayan, 2010). Analyses of online convenience samples compared to convenience samples recruited in person have revealed that the online strategy tends to produce more geographically, socio-economically, and ethnically diverse samples without sacrificing data fidelity (Berinsky, Huber, & Lenz, 2012; Casler, Bickel, & Hackett, 2013). The anonymous nature of the completion may have also contributed to participants being more willing to share with regard to private difficult experiences such as the experience of suicidality (Czyz et al., 2013).

#### 4.7.2. Limitations of study

The large sample size recruited was made possible by the cross-sectional design of the study and the online recruitment strategy, both of which have associated limitations. The cross-sectional nature of the study allowed for an on-going approach to recruitment until a final cut-off point for analyses was reached. This allowed for the large final sample size but such designs, carried out at a single time point with each participant, limit inferences that can be made about causality. There is an assumption inherent in the study that the suicide-specific constructs and transdiagnostic TCB processes are antecedents of suicidality. This assumption is drawn from literature that has demonstrated prospective relationships to that effect (Kovacs & Garrison, 1985; Miller, Esposito-Smythers, & Leichtweis, 2015; Teismann et al., 2016); however, this sequential relationship is not demonstrable within the design of this study.

The means of recruitment was via an online convenience sample. The advantage of this approach was that it allowed for extensive advertising of the study within the time and resource constraints imposed by completing a professional doctorate. Such an approach, however, limits the claims that can be made about whom the

sample represents. The mean age of the sample suggests that younger people were over-represented, perhaps as a result of advertising in online support forums wherein younger users are more prevalent.

The study also relied entirely upon the self-report of participants in order to generate data. For many of the variables of interest, self-report is probably the best means available (e.g., completing validated scales such as the HS or the INQ to generate measures of hopelessness or perceived burdensomeness). For variables such as the presence or non-presence of a diagnosed psychiatric disorder however, greater accuracy of data would have been ensured through some form of corroboration or the use of a diagnostic tool. Again, the nature of the recruitment strategy precluded any such approach. The recruitment strategy employed also limited control over who took part. As outlined, a number of participants aged under 18 submitted data that had to be deleted due to lack of ethical approval for this age group. Finally, the study was only available for participation through the English language. This was due to exclusive English language validation of a number of the questionnaires employed and may have marginalised interested potential participants.

#### **4.8. Future research**

A number of potential future study designs would be helpful in replicating and clarifying the results of the study. Longitudinal research would be a useful avenue of enquiry to further delineate the relationships between psychological constructs associated with suicidality and TCB processes. A study that allowed for a design with multiple time-points could offer evidence for the sequence of events in the development of suicidality. Research has demonstrated that suicidality can occur in acute episodes and also persist chronically and this variability could be analysed through the lens of the variables employed in the current study, perhaps by daily assessment. Such a study would be resource intensive but would allow the prospective and associative influence of the variables to be distinguished. For example, does heightened engagement with TCB processes precede or coincide with suicidality? The present study suggests that engagement in TCB processes might have an ameliorative effect upon the desire for suicide, but the plotting of this interaction at multiple time points is required to confirm this interpretation.

The aim of further distinguishing the concepts in question, such as feeling as though one is a burden, or coping in ways that are ultimately maladaptive could also be explored through a qualitative lens. Jobes (2000) highlights that there is an unfortunate dearth of research relating to the phenomenology of the suicidal experience. The concepts and constructs employed in this study would be useful to explore in conversation with someone that has lived experience of suicidality. Perhaps the suggestion from this research; that potentially maladaptive coping strategies are useful in the short term, could be elaborated upon and new targets for research and intervention identified.

Single case design or other 'small *N*' research would also add to our understanding. A limitation of the present study is that it relies on summed and average scores of groups of participants. This may 'drown out' some of the individual variability in the development of suicidality. It could well be that for some individuals, TCB processes are a useful short-term coping strategy, whereas, for others, they exacerbate a person's difficulties. This could be explored by tracking individual engagement and experience, rather than relying on group average data.

#### **4.9. Summary of findings and conclusion**

This study aimed to explore the role of TCB processes in suicidality. In particular, it sought to explore the relationship of TCB processes to suicide-specific constructs and their combined association with suicidality. The analyses revealed that TCB processes are markedly higher among people currently experiencing suicidality. This pronounced difference remained in a subsample made up only of participants that had received a psychiatric diagnosis. The main predictions of the interpersonal theory of suicide were supported in the study sample and so the additional effects of TCB processes were explored in relation to a statistical model's ability to correctly classify who is currently experiencing suicidality. While TCB processes did not enter the final step of the model as a significant variable, their inclusion did progress the model to being deemed to appropriately fit the data. Their inclusion also produced a minor improvement in classification ability of the model, albeit not a statistically significant one. Finally, the relationship between TCB processes and suicide-specific constructs were explored in greater depth in a structural equation model. The interaction between TCB processes and individual suicide-specific constructs did not demonstrate any indirect effects in relation to

degree of suicidality. However, when the suicide-specific constructs were combined into a latent variable termed 'desire for suicide', the interaction with TCB processes produced a significant moderating effect on degree of suicidality. This effect was in the opposite direction expected i.e., the interaction had a reductive influence on degree of suicidality. It is speculated that engagement in TCB processes may have a short-term ameliorative effect with respect to coping with experiencing the interplay of hopelessness, burdensomeness, and thwarted belongingness.

This study added support for the growing body of evidence that asserts that suicidality is better understood as a complex interplay of psychological phenomena, rather than an outcome or symptom of 'psychiatric disorder'. The results do not allow for a recommendation that TCB processes should be targeted in psychological intervention with suicidality. They do, however, underscore the importance of generating an idiographic understanding of why someone may have become suicidal. As research continues to explore the processes through which suicidality arises and is maintained, hopefully working directly with suicidal thoughts and feelings will become more common in psychological therapies, as opposed to only treating the assumed associated disorder.

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## **6. APPENDICES**

**Appendix 1.** Ethical approval

**Appendix 2.** Participant information sheet

**Appendix 3.** Consent form

**Appendix 4.** Debrief information

**Appendix 5.** Questionnaires

**Appendix 6.** Statistical software output

## Appendix 1. Ethical approval

School of Psychology Research Ethics Committee

### NOTICE OF ETHICS REVIEW DECISION

For research involving human participants

BSc/MSc/MA/Professional Doctorates in Clinical, Counselling and Educational Psychology

**REVIEWER:** Patrizia Collard

**SUPERVISOR:** Trishna Patel

**COURSE:** Professional Doctorate in Clinical Psychology

**STUDENT:** Harry Horgan

**TITLE OF PROPOSED STUDY:** The Moderating Role Of Transdiagnostic Cognitive Behavioural Processes in Suicidal Ideation

#### DECISION OPTIONS:

1. **APPROVED:** Ethics approval for the above named research study has been granted from the date of approval (see end of this notice) to the date it is submitted for assessment/examination.
2. **APPROVED, BUT MINOR AMENDMENTS ARE REQUIRED BEFORE THE RESEARCH COMMENCES** (see Minor Amendments box below): In this circumstance, re-submission of an ethics application is not required but the student must confirm with their supervisor that all minor amendments have been made before the research commences. Students are to do this by filling in the confirmation box below when all amendments have been attended to and emailing

a copy of this decision notice to her/his supervisor for their records. The supervisor will then forward the student's confirmation to the School for its records.

- 3. NOT APPROVED, MAJOR AMENDMENTS AND RE-SUBMISSION REQUIRED** (see Major Amendments box below): In this circumstance, a revised ethics application must be submitted and approved before any research takes place. The revised application will be reviewed by the same reviewer. If in doubt, students should ask their supervisor for support in revising their ethics application.

### **DECISION ON THE ABOVE-NAMED PROPOSED RESEARCH STUDY**

*(Please indicate the decision according to one of the 3 options above)*

Approved
----------

**Minor amendments required** *(for reviewer):*

--

**Major amendments required** *(for reviewer)*

--

### **ASSESSMENT OF RISK TO RESEACHER** *(for reviewer)*

If the proposed research could expose the researcher to any of kind of emotional, physical or health and safety hazard? Please rate the degree of risk:

--

HIGH

--

MEDIUM

1
---

LOW

<i>Reviewer comments in relation to researcher risk (if any):</i>
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**Reviewer** (Typed name to act as signature): Dr Patrizia Collard

**Date:** 18.04.2016

*This reviewer has assessed the ethics application for the named research study on behalf of the School of Psychology Research Ethics Committee*

## **Appendix 2.**

### **Participant Information Sheet**

I would like to invite you to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please read through the following information carefully before deciding whether or not you would like to take part in the research. Talk to others about the study if you wish. If something needs clarification or you have any unanswered questions please do not hesitate to contact the researcher on the details provided below

#### **What is the purpose of the study?**

Thoughts of suicide are not an uncommon phenomenon in the general population. This study aims to explore the relationship between certain patterns of thinking and behaving and thoughts of suicide. The aim of this research is to inform and improve assessment of these experiences by services as well as shape the type of support offered to individuals. The study is part of a Professional Doctorate in Clinical Psychology.

#### **Why have I been invited?**

To explore this research question we require participants that have and do not have thoughts of suicide. So whether this is something you have experienced or not, I would be very grateful for your participation.

#### **Do I have to take part?**

No. It is entirely up to you. If you do decide to take part, you may withdraw at any point without providing a reason for doing so. If you withdraw during completion the survey, all of the information provided to us by you, will be deleted. However, if you complete the questionnaire fully, we will not be able to delete the information you have provided at a later time. This is because your data will be entirely anonymous so we will have no way of identifying which data is yours.

#### **What will I be asked to do if I agree to take part?**

You will be asked to complete a set of questionnaires, to which there are no right or wrong answers. The questionnaires will ask you about your day-to-day

experiences. You are allowed to take breaks if for some reason you would like to stop and re-start at a later time (e.g. feeling emotionally upset). The questionnaires should take approximately 20 minutes to complete.

### **Are there any disadvantages or risks to taking part?**

Some of the questionnaires will ask you about difficult experiences such as low mood or thoughts of suicide and may make you more aware of such experiences. If you feel any discomfort or distress upon completing the questionnaires, the contact details of the researcher are available below. Contact details of a number of helpful organisations will also be made available to you when you complete or withdraw from the study.

### **Compensation**

Four £25 Amazon vouchers will be made available in a draw for participants who complete the study.

### **Complaints**

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions (contact details below). If you wish to complain formally, you can contact Dr. Mary Spiller, Chair of the UEL School of Psychology Research Ethics Sub-committee. (Tel: 020 8223 4493. Email: [m.spiller@uel.ac.uk](mailto:m.spiller@uel.ac.uk)).

### **Will the information I provide remain confidential?**

All the information provided by you is completely confidential; this study does not require any identifying information from you. If you wish to be entered into the draw for an Amazon voucher, you will be asked to provide one method of contact (e.g., email address). This will be stored separately to your questionnaire data. Only the researcher and his research supervisor will have access to the information you provide. Any data entries onto a computer system will only be accessible by the researcher and his supervisor through a password system.

### **What will happen to the results of the research study?**

The results of the study will be written up as a doctoral thesis and submitted for publication in a psychological journal. In all written material of this study your identity will remain completely anonymous. The data will be stored for 3 years, following which time it will be deleted.

### **Who can I contact following the study if I have any questions?**

The researcher, Harry Horgan, can be contacted at:  
School of Psychology  
The University of East London  
Stratford Campus  
Water Lane  
London

E15 4LZ  
E-mail: u1438306@uel.ac.uk

The research supervisor, Dr Trishna Patel, can be contacted at:

School of Psychology  
The University of East London  
Stratford Campus  
Water Lane  
London  
E15 4LZ  
Telephone: +44 (0)20 8223 6392  
Email: t.patel@uel.ac.uk

Thank you for taking the time to read this information sheet.

### **Appendix 3.**

#### **Consent Form**

I have the read the information sheet relating to the above research study and can save a copy for my records by right clicking and selecting "Save as...". The nature and purposes of the research have been explained to me, and I have had the opportunity to discuss the details and ask questions about this information via the contact details provided. I understand what is being proposed and the procedures in which I will be involved have been explained to me.

I understand that my involvement in this study, and data from this research, will remain strictly confidential. Only the researcher(s) involved in the study will have access to identifying data. I understand what will happen to my data once the research study has been completed.

I understand that I have the right to withdraw from the study at any time without disadvantage to myself and without being obliged to give any reason. I also understand that should I withdraw, it will not be possible to have my data withdrawn after full completion of the questionnaire, as the data will be anonymously entered into the dataset.

☐ I consent to participate.

## **Appendix 4.**

### **Debrief Sheet**

Thank you for your participation in this study. Suicide is a serious issue in the UK and worldwide. Thoughts of suicide are not uncommon in the general population with some studies reporting that as many as 14% of us will have had thoughts of suicide in the last two weeks. This research aims to gain a better understanding of how patterns of thinking and behaviours may be associated with thoughts of suicide.

It can be difficult to answer the types of questions that were asked in this study and I very much appreciate your willingness to do so. It is hoped that this research may contribute to the advancement of developing psychological interventions to support those thinking of suicide.

If answering any of the questions in this survey caused you any distress and you would like to speak with someone other than a friend, you may find it helpful to phone the Samaritans UK on 116 123. If you are living outside of the UK Befrienders Worldwide provide anonymous emotional support around the world <http://www.befrienders.org/>.

MIND is an organisation that provides information and support about mental health problems from 9am-6pm Monday-Friday.

Contact number- 0300 123 3393

Website-[www.mind.org.uk](http://www.mind.org.uk)

A detailed list of other self-help organisations can be found at:

[www.self-help.org.uk](http://www.self-help.org.uk)

If you have been experiencing suicidal thoughts or mental distress and wish to seek help, approaching your G.P. is an excellent first step.

If you are already engaged with a mental health service, it may be helpful to speak with your clinician about any of the issues raised in this study if you feel they apply to you.



If you feel that you are in imminent danger of acting on suicidal thoughts, I would encourage you to attend the Accident and Emergency Department of the nearest hospital.

Thank you again.

## **Appendix 5.** Questionnaire schedule (non-copyright materials only)

### *Demographic questions*

**What is your age?**

**What is your gender?**

**Ethnicity**

▼

White English/Welsh/Scottish/Northern Irish/British

White Irish

White Gypsy or Irish Traveller

Any other White background

Mixed White and Black Caribbean

Mixed White and Black African

Mixed White and Asian

Any other Mixed/Multiple ethnic background

Asian or Asian British - Indian

Asian or Asian British - Pakistani

Asian or Asian British - Bangladeshi

Asian or Asian British - Chinese

Any other Asian background

Black or Black British - African

Black or Black British - Caribbean

Any other Black/African/Caribbean background

Arab

Any other ethnic group

*PHQ-8*

Over the <u>last 2 weeks</u> , how often have you been bothered by any of the following problems? (Use "✓" to indicate your answer)	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3

## Appendix 6. Statistical software output

Figure A6.1. PHQ-8 QQ-Plot

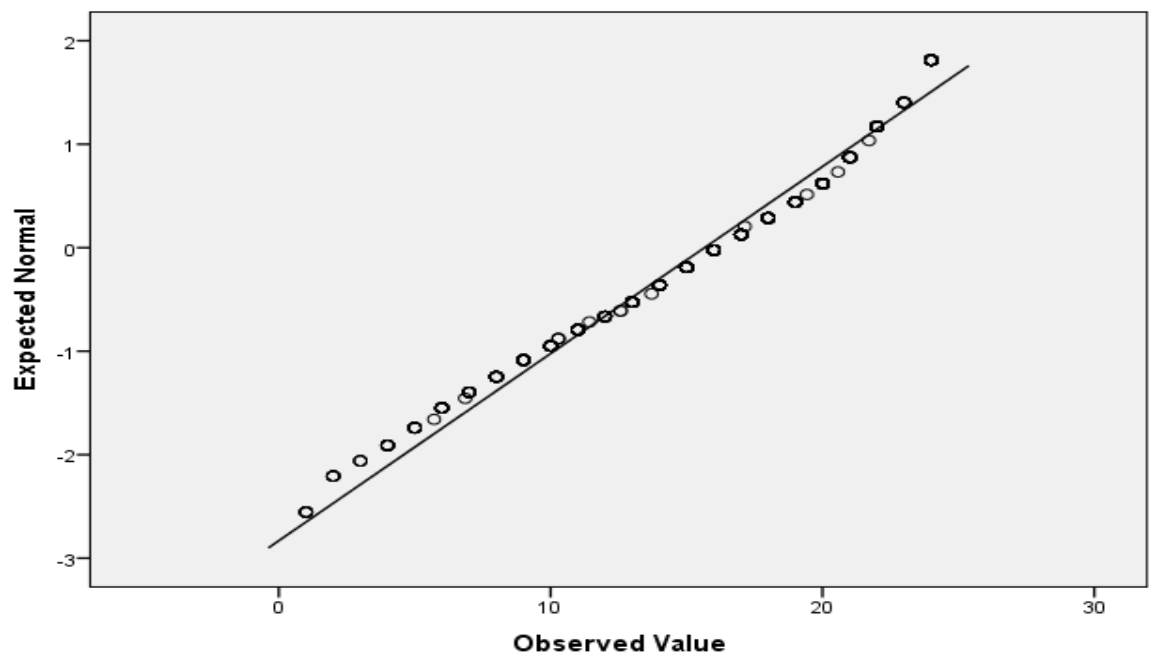


Figure A6.2. Hopelessness QQ-Plot

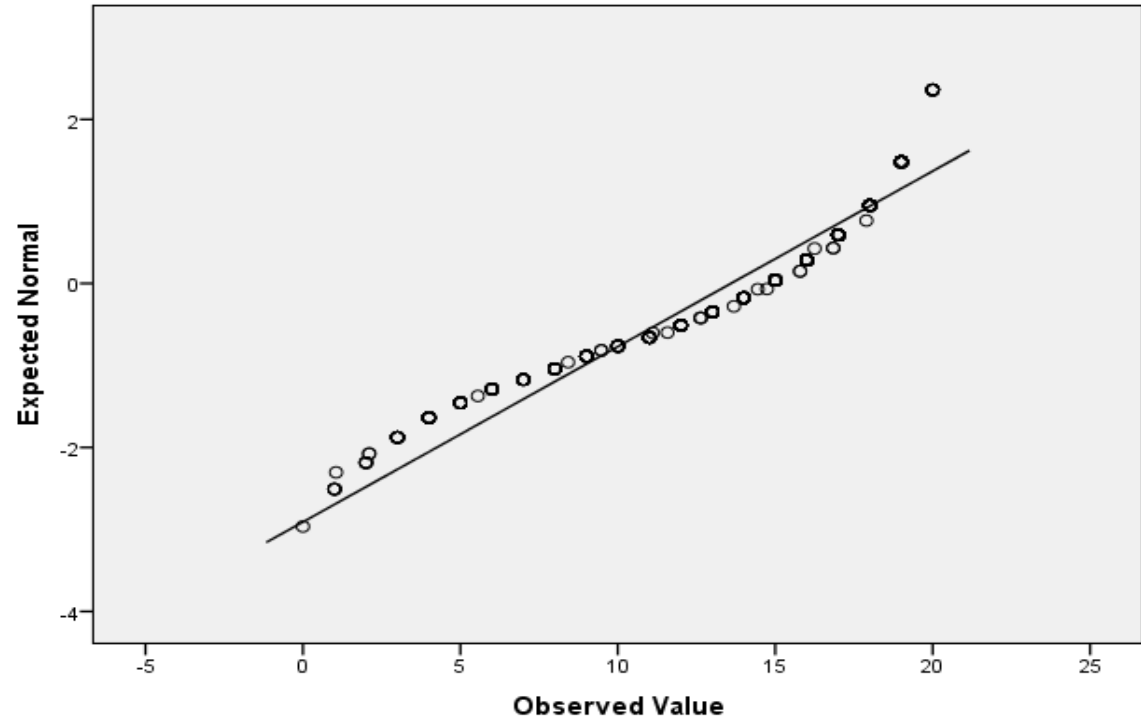


Figure A6.3. Perceived burdensomeness QQ-Plot

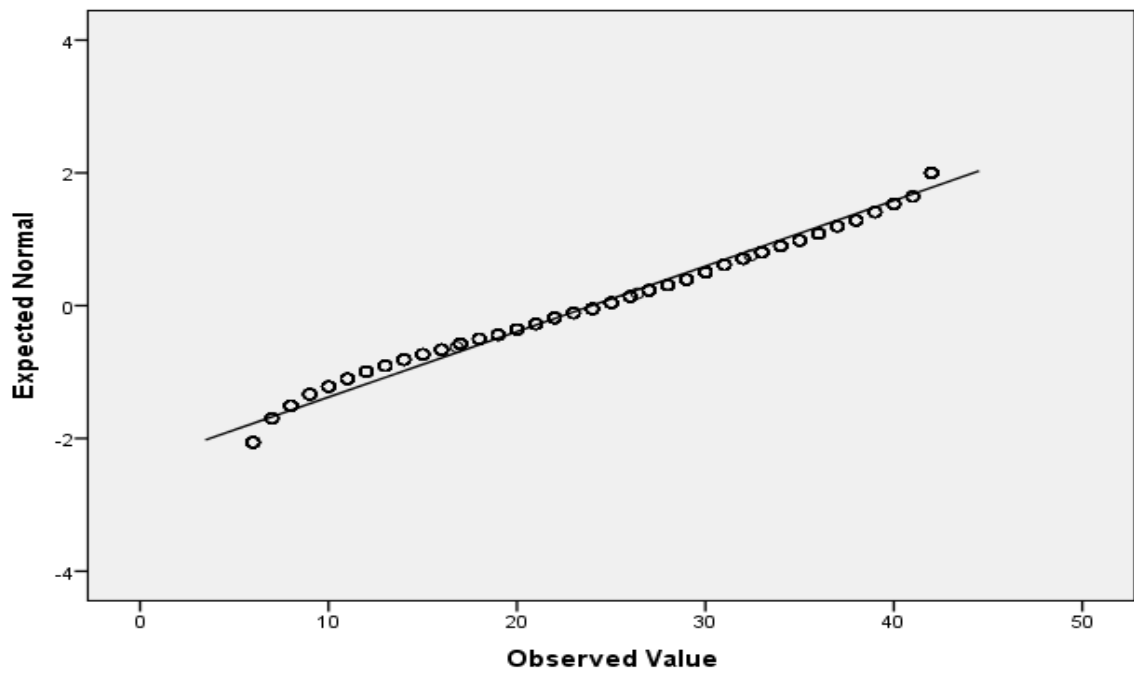


Figure A6.4. Thwarted belongingness QQ-Plot

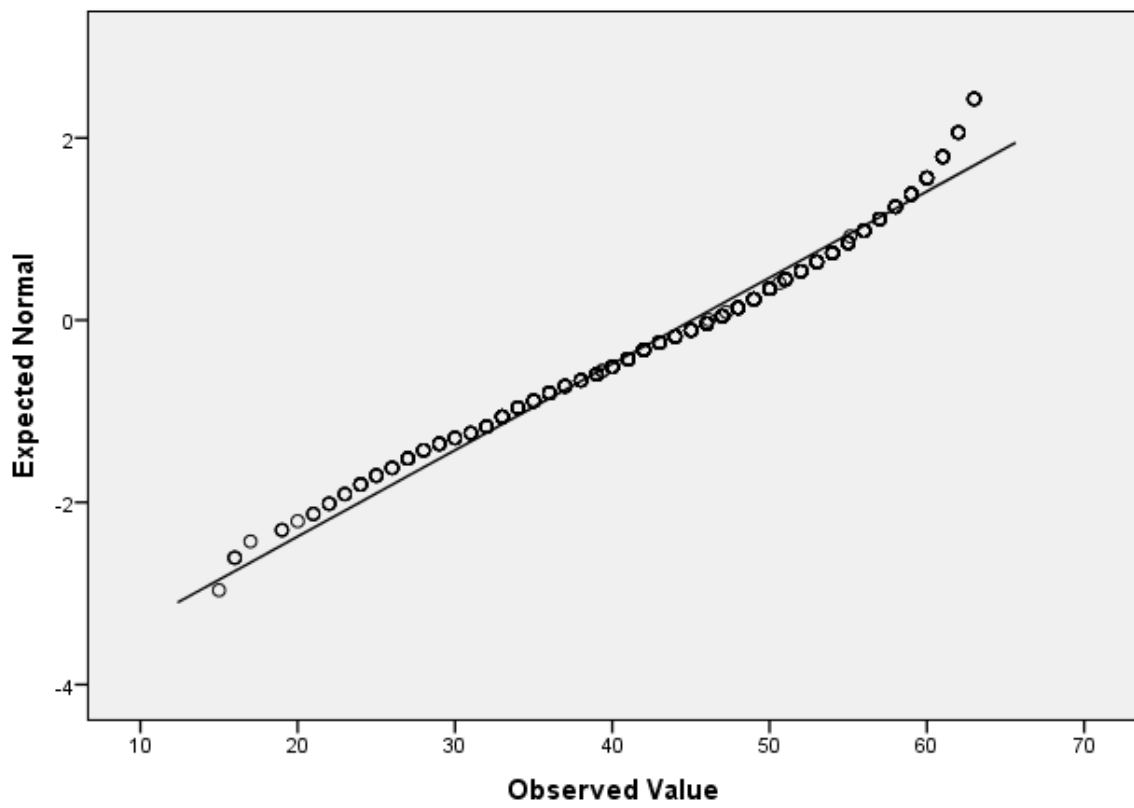


Figure A6.5. Age QQ-Plot

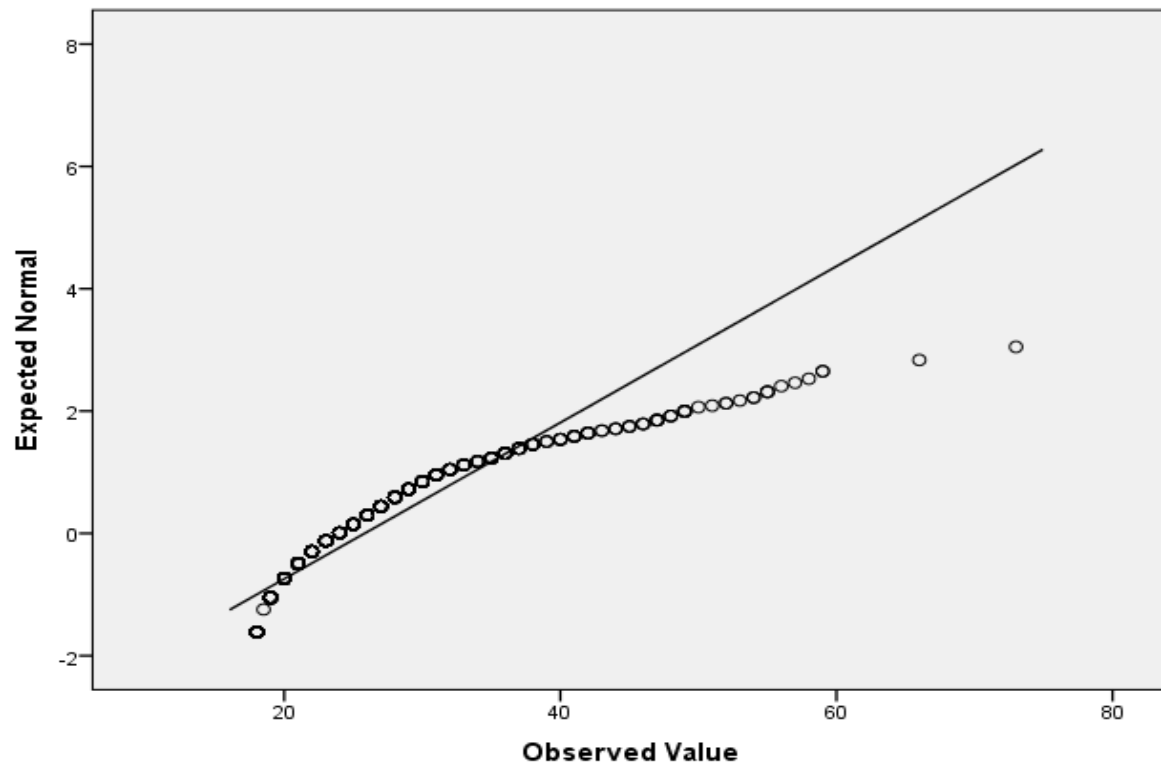


Figure A6.6. Suicidality QQ-Plot

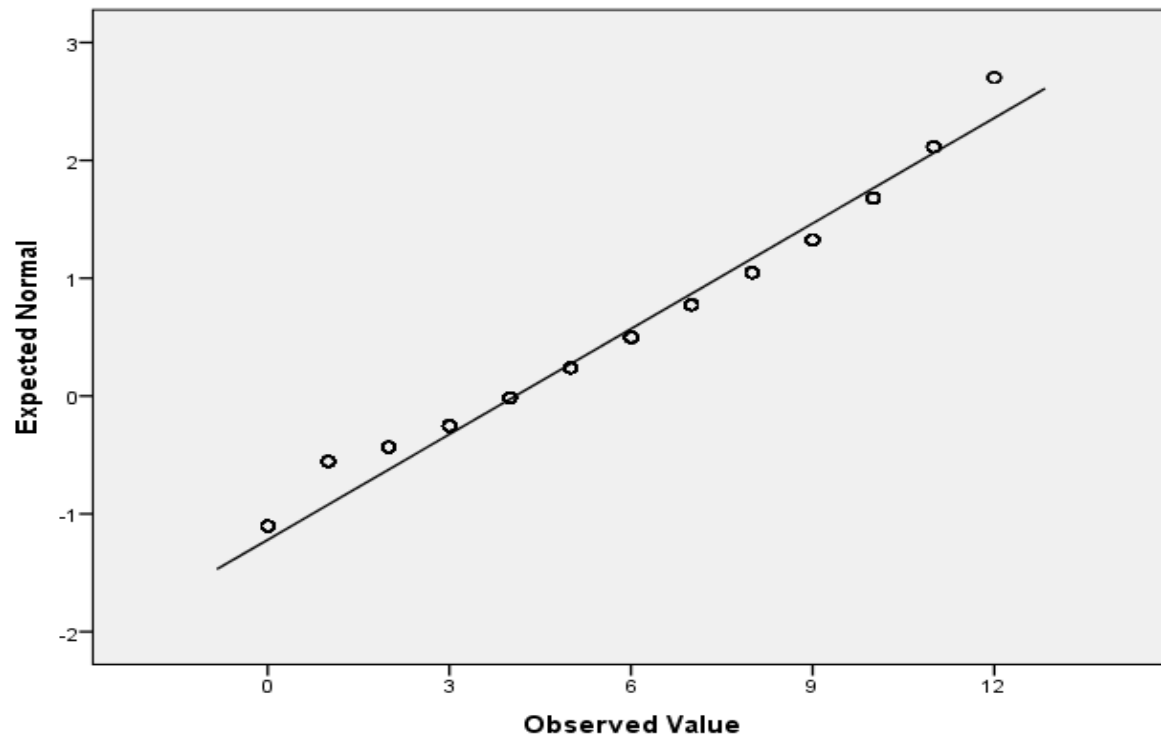


Table A6.1. Leverage values of outliers summary statistics (all continuous variables)

	Minimum	Maximum	Mean	Std. Deviation
Centered Leverage Value 1	.00192	.10891	.0138	.01071
Centered Leverage Value 2	.00137	.05193	.0069	.00481

Figure A6.7. CBP-Q outliers in boxplot full sample

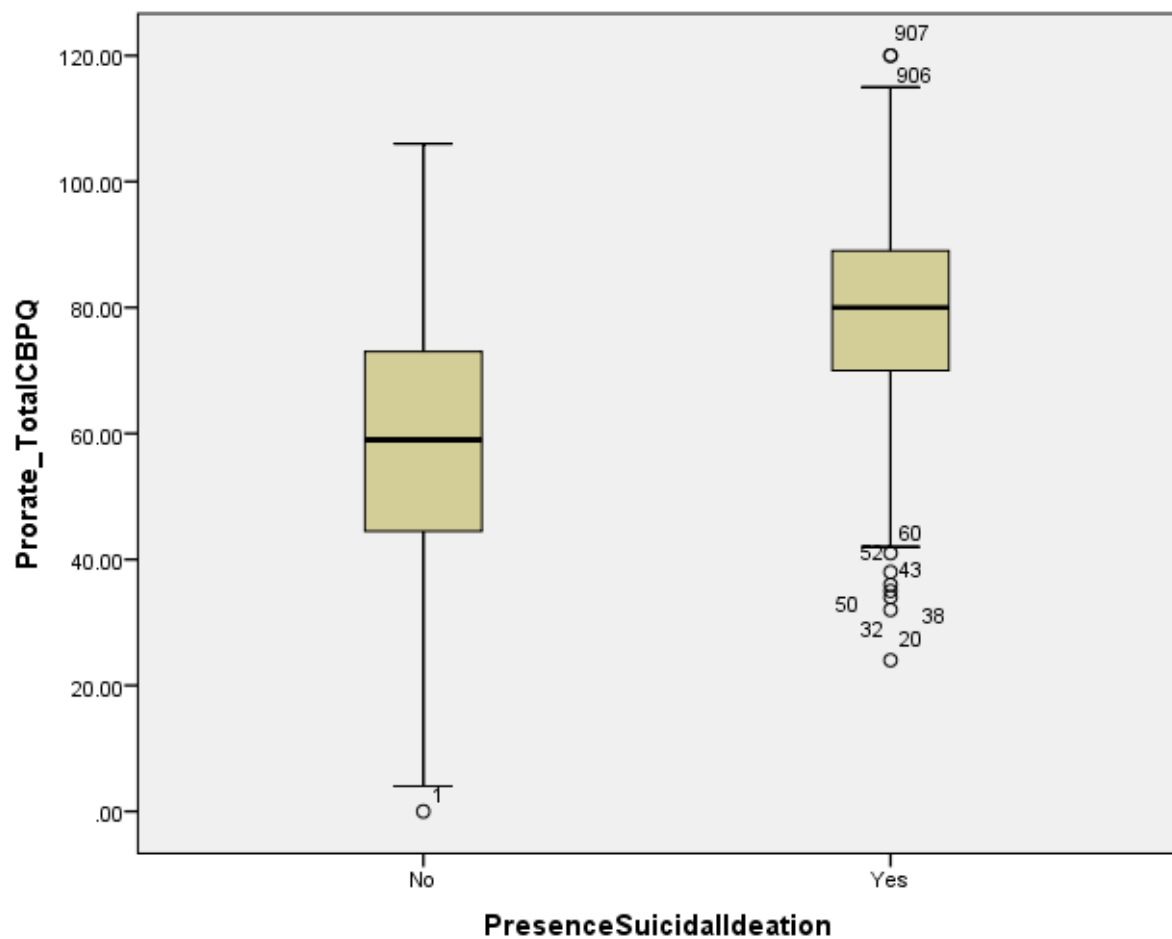


Figure A6.8. CBP-Q outliers in boxplot subsample with psychiatric diagnosis

